THE IRON AGE

New York, August 19, 1926

ESTABLISHED 1855 VOL. 118, No. 8

Motor Plant Steps Up Production

Changes in Equipment Reduce Time for Machining Flywheels, Clutch Disks and Other Parts—Heat-Treating Furnaces Equipped with Loading Device

BY L. S. LOVE

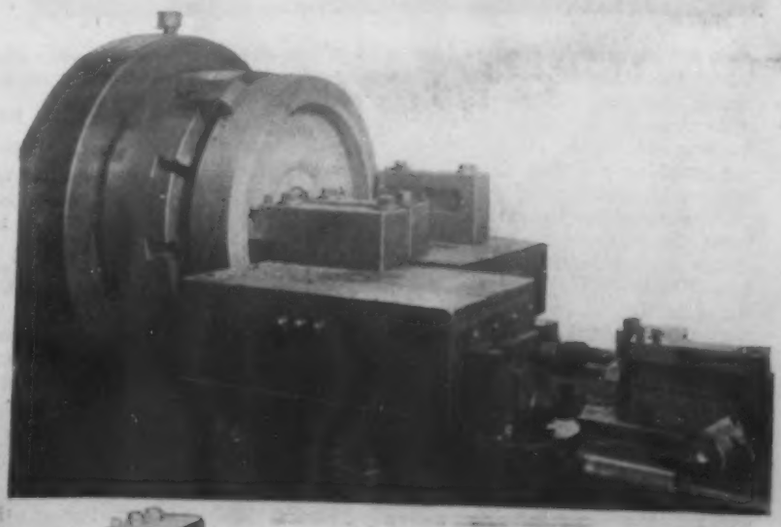
SOME of the production methods in use at the Plainfield, N. J., plant of the International Motor Co. were described in THE IRON AGE, Aug. 16 and 23, 1923, pages 389 and 481, respectively. At this plant motors only are manufactured. Since that time the company has had to resort to still further improvements to keep in step with the increasing demand for Mack trucks and the new development of Mack buses. The latter field has called for two new motors, a four-cylinder and a six-cylinder, each cast en bloc, whereas the motors for trucks are built with cylinders cast in pairs. While the manufacture of these motor blocks has called for no new methods of production of outstanding interest, per se, it has put a load demand on some of the parts departments which had to be met with increased output. How the demand for stepping-up the output of some of the new motor parts was met is outlined in this article.

An explanation of the method of setting piece rates at this plant will assist in understanding the production time given in connection with some of the pieces shown in the accompanying illustrations. The time studies are made on the decimal basis, and production time taken in hundredths of an hour. When a new method is installed a first-class operator is timed in producing ten pieces. To the actual average time required, 30 per cent is added to establish the allowed time as a piece rate for the job. Any reduction of this time by the regular operator earns for him a bonus. Comparisons given below of old time and new are of allowed time.

Output of Flywheels Increased

An outstanding factor in the new time reductions was the introduction to the shop of Simplimatic lathes. These machines, while they perform the service of turret lathes in the production of several operations through multiple tooling, have no turrets. The two tool slides are provided with a group of tools to do desired work and are also equipped with special barrel

Fig. 1 (below)—A Machine for Each Multi-Cut Operation of Roughing and Finishing Both Sides of Flywheels Is Saving Approximately ¾ Hr. per Wheel. Time between cuts is saved by air-chucking



Accuracy Is Held by Hardened Register Pins for Finishing Cuts. Clutch fit and rim are machined in one setting. Fig. 2 (above) shows method of roughing crankshaft flange fit and the rest of other side of wheel

cams incorporated in the feed mechanism, one for each slide, to control the feed and rapid advance or withdrawal of the slide by power. Fast and slow turning of the cams and fast and slow rotation of the lathe spindle may also be controlled by gear changes incorporated in the head end of the machine. Aside from these possible changes, each machine in a group is equipped to do only one sequence of operations, and is not changed after once set up. Yet these are not strictly single-purpose machines, for by changing the cam and tool slides, they may, on a change in design of the work, be altered to machine the changed piece, or to handle an entirely different piece. To facilitate chucking and reduce time between cuts, each machine is provided with an air-operated chuck.

One battery of four of these machines is engaged in making flywheels, such as shown in Figs. 1 to 4. Two sizes of these flywheels, 19 in. and 22 in. in diameter, are machined. Change from a lot of one size to a lot of the other size is made simply by adjusting the chuck, changing the tool slides with tools and the tool slide cams, to control proper tool advance, feed or dwell for one slide or the other. The four machines are used for roughing and finishing the two sides of the wheel, one machine being employed on each operation.

The roughing operation, Fig. 1, on the first side turns the wheel, faces and bores the flange, faces the clutch fit, the hub, and bores. The wheel is next removed to the second lathe in the group for the roughing operation on the other side, Fig. 2. In this operation the wheel is gripped by outside jaws on the periphery and the machining consists of facing the second side of the flange, boring the flange and also boring the crankshaft flange fit. The arrangement of tools on two slides for multiple cuts is shown in Fig. 3.

The chucks for the finishing operations, instead of depending upon the accuracy of chuck jaw faces for close setting, are provided with three hardened stops each, with ground faces, as shown in Fig. 4, against which the turned face of the flange abuts. While in the first finishing operation chucking registers from a surface which is only rough turned, the second which calls for one dimension of extreme accuracy registers from a completely finished surface. In the first finishing set-up the outside diameter is turned, the flange is faced and bored and has a radius turned on the outside edge. Also the clutch fit is faced as well as the hub, being faced and bored.

The final operation, and the one calling for the most precision in the turning of flywheels, is the finishing of the second side. In this set up, as in that for finishing the first side, the casting, with one side completely finished, is registered with that side against the three stops with hardened and ground faces. The machining consists of facing and boring the flange, with a radius turned on the edge, and the boring of the crankshaft fit. This last operation is checked with a "go" and "no-go" gage and is held to a tolerance of plus or minus 0.0005 in., as it comes from the lathe, without any subsequent reaming operation.

Without increasing the number of men on the flywheel job there has been a marked increase in the production, with a saving of 43.8 min. per wheel. The old method employed two men on two turret lathes and required 0.93 hr. per wheel. The new method employs two men on four machines and turns out a finished wheel in 0.20 hr., a saving of 0.73 hr. per wheel. With the complete battery a wheel entirely finished is turned out every six to seven minutes.

Fig. 3 (at Right)—Tools For Multiple Cuts Are Arranged on Two Slides for Either Roughing or Finishing Operations. Finishing tools are shown

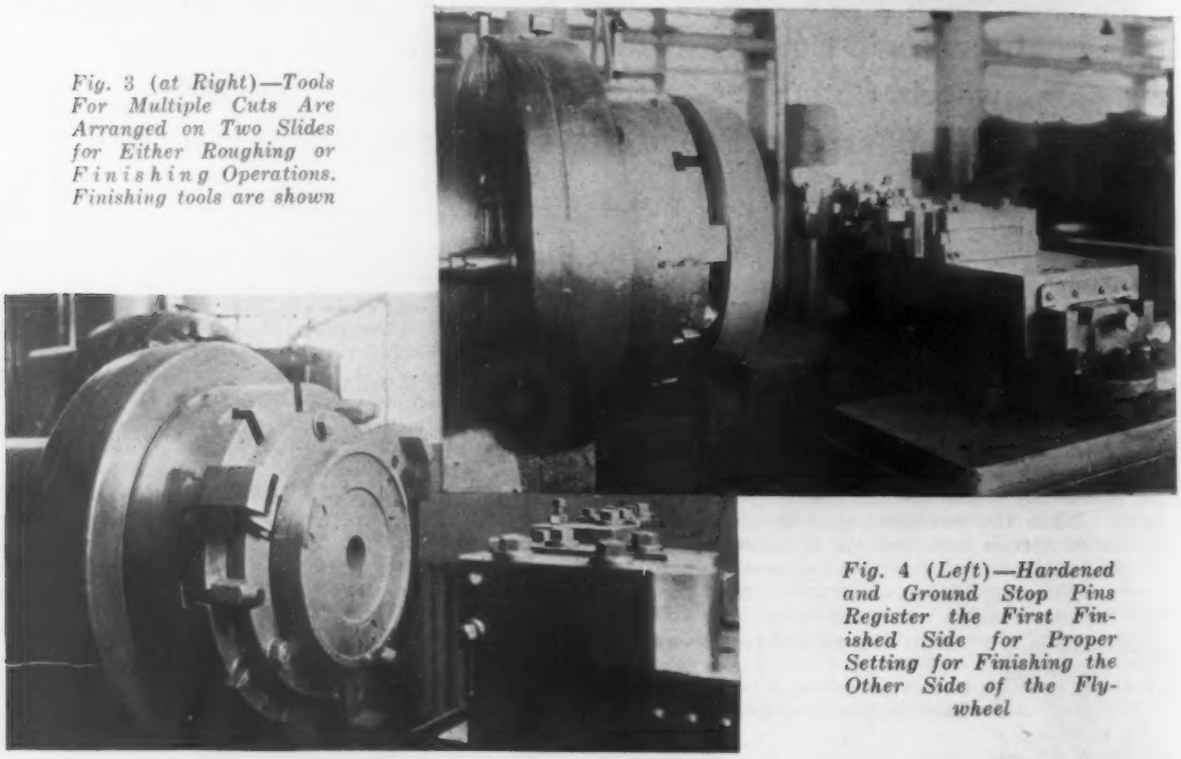


Fig. 4 (Left)—Hardened and Ground Stop Pins Register the First Finished Side for Proper Setting for Finishing the Other Side of the Flywheel

Time Saved in Machining Clutch Disks

Further use of the Simplimatic to reduce production time has been made in the manufacture of clutch disks, shown in Fig. 5. On this operation one man cares for two machines and equals the former output of three men. The disks are 21 in. in diameter and must be faced on the clutch side and turned to suit the clutch fit in the flywheel. The old time for this side was 0.26 hr. In the second machine the back of the disk is faced and the bore machined in 0.65 hr., making a total time for the finished disk of 0.91 hr. By the present method disks are turned out at the rate of one every 0.105 hr. or 6.30 min., a saving of about 48 min. per disk.

Automatic Crankshaft Lathes Facilitate Production

Another recent innovation at this plant is the installation of a battery of LeBlond automatic crankshaft lathes. These machines are used for turning crankpins which are later finished to exact size on grinders. The former time for turning these pins was 0.75 hr. per shaft and the work was done in a non-automatic lathe, one pin at a time, but all four pins being done in the same machine.

In the battery of automatic lathes, part of one of which is shown in Fig. 6, each machine turns two pins at once with tools mounted on double carriages at front and rear. The two slides on the rear carriage carry

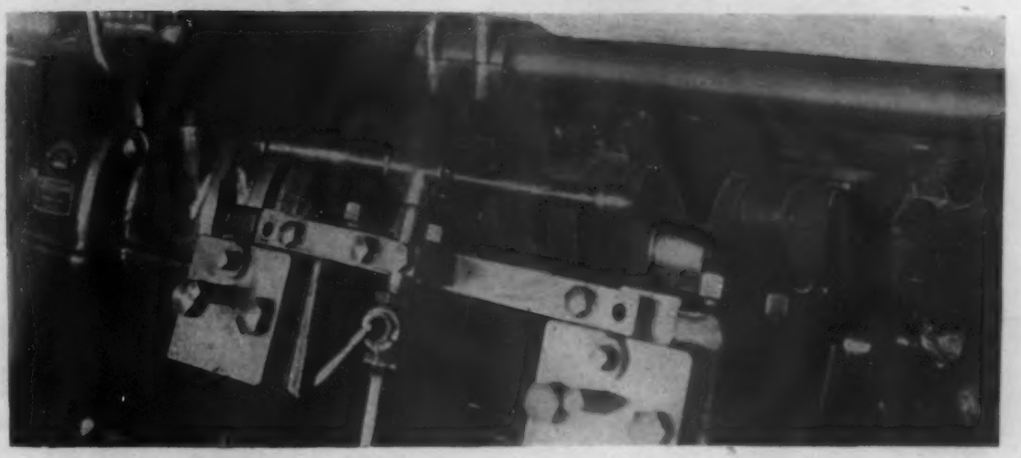


Fig. 6 (at right) — Multiple Cutting and Machining of Two Pins at a Time Make for a Saving of 36 Min. Each on Four-Pin Crankshafts

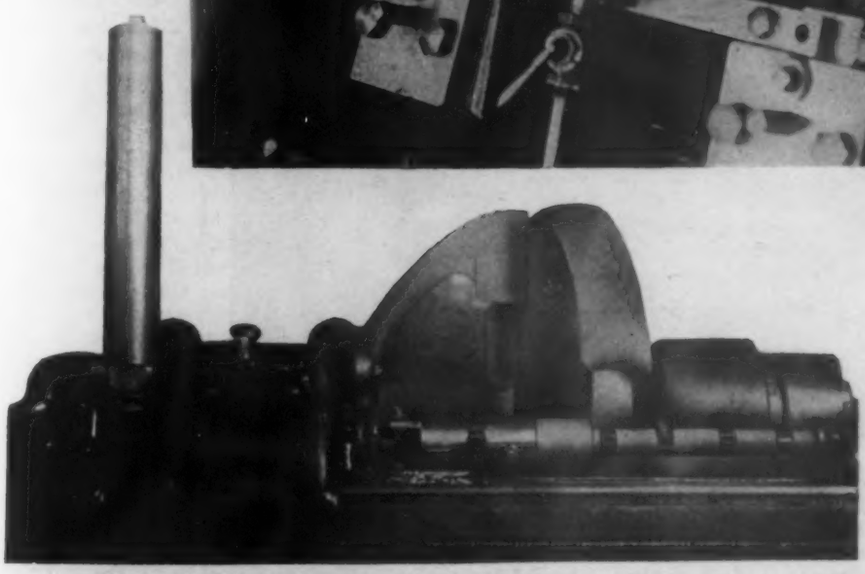


Fig. 7—Avoidance of Chatter, Thereby Eliminating the Hand Stoning of Cam Noses, Has Resulted in a Saving of 4 Hr. per Four-Cam Camshaft. Tolerance also reduced

two tools each. The slides on the front carriage carry one tool each placed midway between the rear tools opposite, but with cutting edges slightly overlapping. In this manner the pin journals are turned on the ends by the rear tools and the middle sections by the front tools. Two machines are used for a four-throw crankshaft and turn the pins to within 0.003 in. of finished size, which amount is later removed by the grinder. The turning time is 0.15 hr., a direct saving of 0.60 hr. or 36 min. per shaft.

Other recent improvements in methods have to do with grinding operations. The first of these is on a camshaft machine, Fig. 7, and consists of a flexible coupling drive in place of the older geared drive method for controlling movement from the master cam to the cam being ground. It is stated that the change has saved 4 hr. per shaft when it is considered that due to lack of chatter or gear marks, no stoning of the nose of the cam is needed. The actual time on the grinder has also been reduced from 0.65 hr. to 0.55 hr. The machine equipped with this flexible coupling driven control has also enabled the company to cut tolerance limits 40 per cent.

The other grinding operation is a development from finish turning pistons, to grinding by the "plunge" or straight-in feed method with a wide wheel, then to the

Fig. 5 (at right)—A Saving of 45.6 Min. Is Made on Each Clutch Disk. This is regarded as no mean accomplishment in this day of split-second machine production

Fig. 8 (at left)—Traverse of Work Past Grinding Wheel or Vice Versa Has Been Found Desirable, to Maintain Accuracy on Pistons

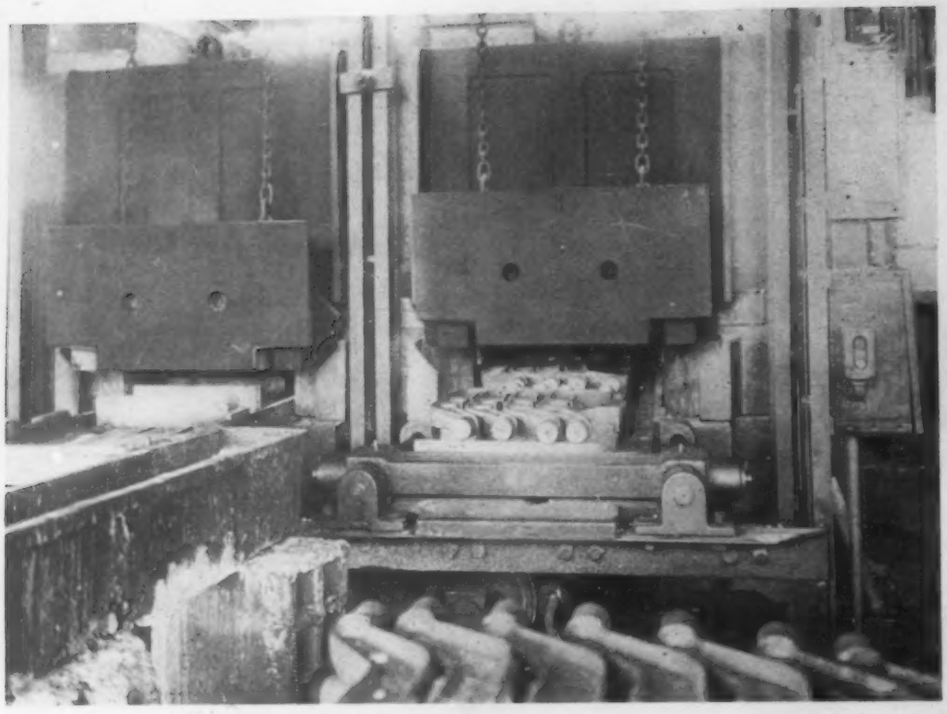


Fig. 9—A Motor - Operated Loading Device Helps to Increase Furnace Output in Heat-Treating Department

use of a standard grinder with narrow wheel traversed over the face of the piston, Fig. 8. It was found that, due to spring in the casting, as between the skirt end of the piston and the rigid closed end, tolerances could not be maintained by the straight-in feed method. These tolerances are plus 0.000 in. for roundness and minus 0.001 in. for taper. Also the time has been cut two-thirds over the previous method of finishing pistons.

Improved methods have also been installed in the heat-treating department where a number of furnaces have been provided with an unusual type of loading device, shown in Fig. 9. This consists of a pusher bar extending across an extension of the furnace bed. The pusher arm is operated by crank levers actuated by motor drive and gear reduction mounted below the extended furnace bed. Work is placed to fill the surface of this extension, when the motor is started and the pusher bar is called on to push that load through the furnace door and return to its outer position, when another batch is placed for insertion into the furnace. This process is continued until the full depth of the furnace bed is filled with parts to be annealed, carburized or otherwise heat-treated.

New Company to Rust-Proof Steel

A new company has been incorporated, entitled the Cromilite Process Corporation, by interests identified with the New Haven Sherardizing Co., which has a plant in Hartford, Conn., and with other interests identified with the Metal Protection Corporation of Indianapolis. The officers of the new company are: President, August F. Schoen; vice-president, James E. Patten, Indianapolis, and treasurer, Wesley I. Charter, Hartford. The new company will engage in the rust-proofing, metal finishing and chrome-nickeling of steel under a process invented by Mr. Patten. The first unit of the new company's plant is to be established at Akron, Ohio, and its operation is expected to commence some time this month. The company is also acquiring property adjoining the Hartford plant at Windsor Street and it is stated that a third plant will be established in Springfield, Mass.

New German "Wafios" Barbed Wire

A German barbed wire machinery manufacturer has patented a machine for barbed wire of one strand and two German manufacturers have been licensed for the sole production of this sort of barbed wire. The sales are said to be satisfactory. The per ton prices are higher than the usual two-strand wire, but the linear prices are much lower. At present the B. W. G. No. 12 wire is sold at 17s. 10d. ($4.25); the B. W. G. No. 13 wire at 18s. 7½d. ($4.50), and the B. W. G. No. 14 at 19s. 6d. ($4.75) per cwt., f.o.b., which means about 6s. to 7s. per cwt. more than the usual barbed wire.

The difference is the weight, as 1000 kg. of wafios wire has a length of 15,530 meters (B. W. G. No. 13) and of the usual barbed wire only 8600 meters, so that 1000 meters of wafios wire weighs only 64.4 kg., whereas the usual wire weighs 113.3 kg. The buyer of wafios wire is getting, therefore, if buying one ton, about 75 per cent more wire and is paying 50 to 60 per cent more for it. The two plants making this wire are selling monthly increasing quantities in Germany and other European countries and have had success overseas.

Spanish Ore Shipments Low

WASHINGTON, Aug. 16.—With only 31,000 gross tons of iron ore exported from Bilbao during July, as against 89,000 tons in June, the situation in the Spanish iron ore industry is becoming more unfavorable, according to a cable from Commercial Attaché Charles H. Cunningham, Madrid. Stocks on hand amount to 800,000 tons, and several important mines of long standing have had to shut down.

Canadian Automobile Output Gains

The total automobile production in Canada during the six months' period ended June 30, 1926, amounted to 124,878 cars, as compared with 93,647 in the corresponding period of 1925, according to a report to the Department of Commerce from Lynn A. Meekins, trade commissioner at Ottawa. Automobile production in Canada during June totaled 21,571 units, of which 17,785 were passenger cars, 2586 were trucks, 1354 chassis and 26 taxicabs and buses.

More than three miles of enameled metal shelving are contained in the new office and hardware wholesale warehouse of Hibbard, Spencer, Bartlett & Co., Chicago. The new building is 13 stories in height and practically all of this shelving has been placed on three floors.

How Metal Tubing Should Be Tested

Tensile Properties as Affected by Shape of Test Specimens—Tube Diameter the Influential Factor

BY N. S. OTEY*

IT is often desirable in conducting tensile tests for determining the properties of material in structural shapes to load the entire cross section, thus eliminating the expense of machining the conventional round or flat specimens. Perhaps the best example of this is found in testing tubing which is extensively used in aircraft and other construction as an echronomic section.

Heretofore, it has been generally assumed that such full section tests indicated properties of material directly comparable with those obtained when testing the conventional round and flat specimens. This, however, is not the case since the characteristic of the section loaded has a very prominent influence on the indicated properties of the material. This assumption has led to errors in test results with consequent failures in service.

Ordinarily, tubing that has a tensile strength within the capacity of the largest testing machine conveniently available is tested in full section while larger tubes are flattened and specimens prepared similar to those used for sheet metals. Furthermore, it is current practice to specify that tubing show given tensile properties regardless of whether full section or flat specimens are used. Under these conditions test results may be in error as much as 100 per cent and, unfortunately, these errors are on the unsafe side leading to the acceptance of materials having low ductility.

Some recent tests made at the Naval Aircraft Factory demonstrated that the percentage elongation over a given gage length of a tube, tested in full section, was very different from that of a flat specimen prepared from the same tube. For example, three different types of tensile specimens were machined from a single bar of mild carbon steel to dimensions shown in foot notes of Table I. They were all of conventional design and the round and flat types were so cut that their longitudinal axis coincided with a line midway between the inside and outside periphery of the tube specimen, thus insuring comparable material. These specimens were tested with results shown in Table I and Fig. 1. With these and other preliminary tests as a basis, a more extensive investigation was made covering three classes of materials: S. A. E. No. 1025 steel, S. A. E. No. 2330 steel and an aluminum alloy, commonly known as duralumin or 17S.

*Engineer of tests, Naval Aircraft Factory, Philadelphia.

The tube diameters and gage thicknesses of materials used in this investigation are shown in the first two columns of Tables II, III and IV. In order to obtain materials of reasonable uniformity, a process of selection from physical tests was adopted in which three tubes of each size and gage were tested and one of the three selected which had a tensile strength nearest the specified value, as follows:

Material	Specified Tensile Strength
S.A.E. No. 1025 Steel (Normalized)	55,000 lb. per sq. in.
S.A.E. No. 2330 Steel (Heat-Treated)	125,000 lb. per sq. in.
Duralumin (Heat-Treated)	55,000 lb. per sq. in.

The specified chemical analyses under which these materials were purchased and inspected were:

Steel:

S.A.E. No.	Carbon, Per Cent	Mang., Per Cent	Phos., Per Cent	Sulph., Per Cent	Ni., Per Cent
1025	0.20 to 0.30	0.50 to 0.80	0.045 max.	0.050 max.	
2330	0.25 to 0.35	0.50 to 0.80	0.040 max.	0.045 max.	3.25 to 3.75

Duralumin:

Al., Per Cent	Mang., Per Cent	Mag., Per Cent	Copper, Per Cent
92.0 min.	0.4 to 1.0	0.2 to 0.75	3.5 to 4.5

From each test tube, as above selected, three full section or tube specimens and four flat specimens were taken, Fig. 2, and were machined to dimensions shown in Figs. 4, 5 and 6. The flattening of sections for flat specimens indicated in Fig. 5 was done by pressing between steel plates in a testing machine. This operation does not seriously affect the tensile properties of the material since cold working occurs principally in a direction normal to the longitudinal axis of the specimens. Furthermore, these effects of cold working are practically eliminated by heat treatments applied subsequently to flattening and machining.

In all cases the flat specimens were placed inside of their corresponding tube specimens during heat treatment operations to aid in maintaining uniform temperature control of each lot. The following heat

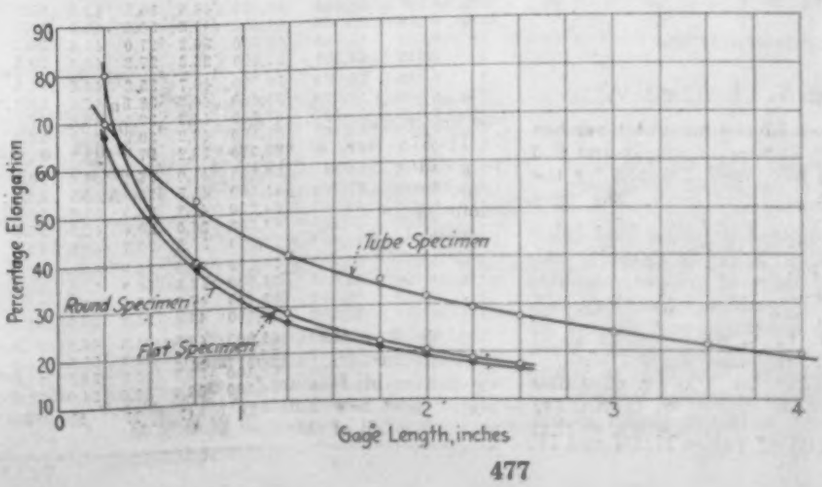


Fig. 1—Results of Tensile Tests on a Single Bar of S.A.E. No. 1025 Steel, Using Three Types of Specimens, Shown in Table I

treatments were applied, subsequent to all machining operations:

S.A.E. No. 1025 Steel (Normalized)

Heated gradually to 1625 deg. Fahr., held for 20 min., cooled in still air at room temperature.

S.A.E. No. 2330 Steel (Heat-Treated)

Heated gradually to 1475 deg. Fahr., held for 20 min. at 800 to 1000 deg. Fahr. depending on the hardness after quenching, as follows:

Brinell Hardness

After Quenching	Tempering Temp., Deg. Fahr.
425 to 475	800
475 to 525	900
525 to 575	1,000

Duralumin (Heat-Treated)

Heated in a 50-50 salt bath of sodium and potassium nitrates for 20 min. at 935 deg. Fahr., quenched in water at room temperature. After this treatment the material was allowed to age in still air at room temperature for 25 days before testing.

Fig. 2—Layout for Cutting Specimens from Tubes

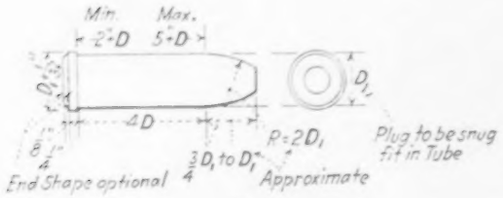


Fig. 3

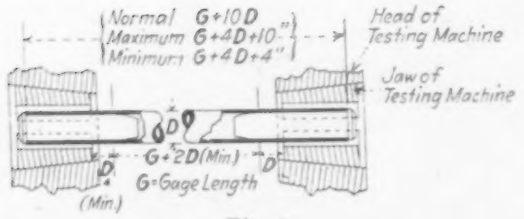


Fig. 4

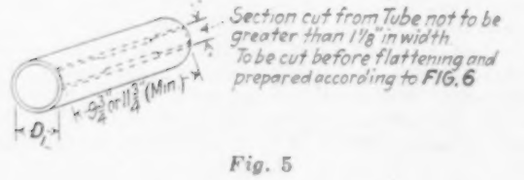


Fig. 5

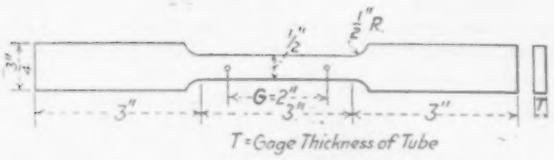


Fig. 6

Specimens having a computed breaking load below 50,000 lb. were tested in a 50,000-lb. capacity universal testing machine and those of greater computed load in a 200,000-lb. capacity machine. Auxiliary self-aligning test grips on flat specimens and the set up shown in Fig. 4 on tube specimens were used. Much care was exercised in conducting these tests to insure the elimination of any variables in testing methods.

Complete results of these tests are shown in columns (C), (D), (G) and (H) of Tables II, III and IV.

Table I—Comparison of Elongation of Round, Flat and Tube Specimens Cut from Single Bar of 1025 Steel

Gage Length in In.	Percentage Elongation		
	Tube	Round	Flat
¼	70	68	80
⅝	53	38.8	40
1¼	41	26.9	28.5
1⅝	35.2	21.2	22.2
2	32	19.1	20.2
2¼	29.5	17.6	18.7
2½	27.5	16.5	17.2
3	24	...	...
3½	21.5	...	...
4	19.3	...	...
Ult. tensile strength, lb. per sq. in.	70,600	71,500	70,500

Dimensions:

Tube—1.372 in. outside diameter and 0.878 in. inside diameter.

Round—0.500 in. gage diameter and 3 in. parallel length.

Flat—Same as shown in Fig. 2.

The values shown are the average of three full section and four flat specimens. From these data it will be observed that no well defined difference in tensile strength exists between full section specimens and flat specimens of the same material. The elongation of full section specimens, however, is consistently greater than that of flat specimens and further examination may well be confined to these differences.

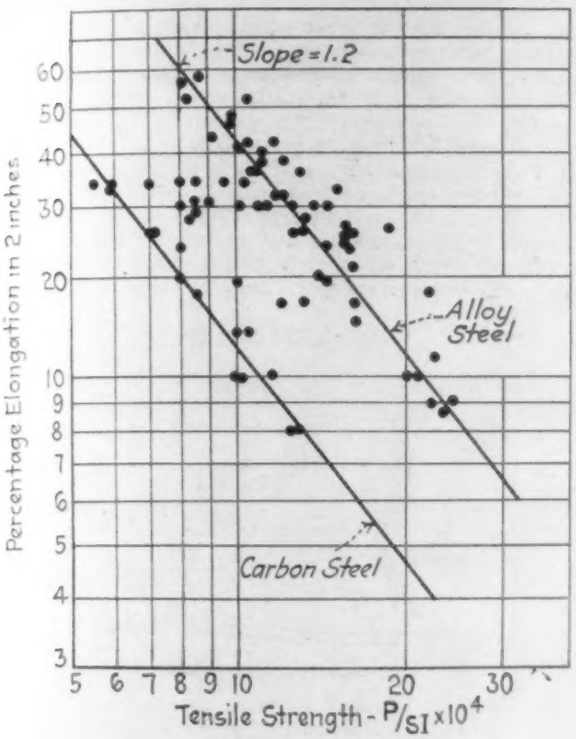
As a probable working basis for analyzing these results, let us assume that the differences in elongation may be due to variations in:

(a) Tensile strength.
(b) Geometric characteristics of the section loaded.

Variations in tensile strength for a given material can be practically eliminated by correcting the elongation values to correspond to specified tensile values, which for these materials and heat treatments, are as follows (on next page):

Table II—Comparison of Tube and Flat Specimens of 1025 Steel, Normalized

Nominal Outside Diameter, In.	Nominal Gage Thickness, In.	Ult. Tensile Strength, Lb. per Sq. In., Tube Specimens	Ult. Tensile Strength, Lb. per Sq. In., Flat Specimens	Per Cent Elong. in 2 In., Tube Specimens	Per Cent Elong. in 2 In., Flat Specimens	Corrected Elongation, Tube Specimens	Corrected Elongation, Flat Specimens	Difference in Corrected Elongation for Tube and Flat Specimens
⅝	0.028	56,400	55,900	32.2	25.0	33.2	25.5	7.7
⅝	0.028	55,300	55,300	37.0	30.1	37.2	30.3	6.9
⅝	0.035	61,200	56,200	35.5	31.0	41.1	32.0	9.1
⅝	0.042	55,300	54,800	36.7	29.5	36.9	29.3	7.6
⅝	0.058	57,000	55,500	41.0	32.0	42.8	32.3	10.5
⅞	0.035	64,560	63,100	39.5	30.3	48.5	36.5	12.0
⅞	0.049	52,000	50,700	46.8	35.5	43.5	31.9	11.6
⅞	0.058	55,600	54,600	41.3	30.6	41.5	30.2	11.3
1	0.035	65,760	66,200	36.2	27.0	45.6	34.2	11.4
1	0.042	63,300	57,900	36.3	27.8	43.5	29.5	14.0
1	0.058	52,970	50,500	46.7	35.3	44.5	31.8	12.7
1⅛	0.058	58,600	55,600	44.8	33.1	47.5	33.4	14.1
1⅛	0.035	51,600	48,600	44.2	32.3	40.8	27.5	13.3
1¼	0.058	60,400	57,160	43.2	30.8	48.8	32.2	16.6
1¼	0.049	63,700	62,370	38.2	27.0	45.1	31.8	13.3
1¼	0.042	60,400	59,100	41.0	27.4	46.0	30.1	15.9
1½	0.035	63,360	61,900	41.5	28.5	49.8	34.0	15.8
1½	0.058	64,960	60,200	43.8	28.5	51.2	32.0	19.2
1½	0.049	63,100	65,500	36.0	20.4	42.0	25.5	17.5
1½	0.049	71,500	72,200	35.5	22.7	49.5	32.2	17.3
1⅝	0.058	57,450	56,800	47.5	30.8	50.5	31.9	18.6
1⅝	0.058	59,050	57,900	47.8	30.0	52.2	32.0	20.2
1¾	0.049	63,500	59,400	47.7	32.4	57.5	35.8	21.7
1¾	0.058	61,300	58,600	43.8	28.9	50.0	31.3	18.7
1⅞	0.058	52,700	49,000	49.5	31.6	46.8	27.3	19.5
1⅞	0.065	57,700	56,600	52.2	32.8	55.5	34.0	21.5
2	0.058	58,300	54,100	53.8	35.8	58.5	35.0	23.5
2	0.065	56,700	54,300	52.0	31.6	54.0	31.3	22.7
A	B	C	D	G	H	E	e	E-e



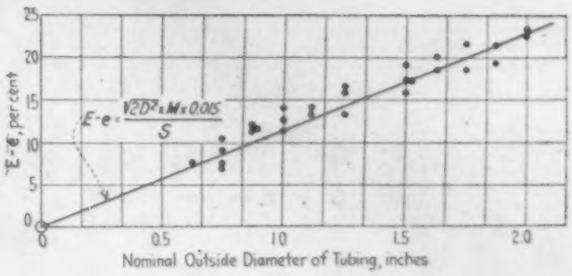


Fig. 7—Relation Between Elongation and Tensile Strength for 72 Different Steels, Bureau of Standards Circular No. 101 (at Left)

Fig. 8—Material Is S.A.E. No. 1025 Steel (Normalized); Tensile Strength 55,000 Lb. per Sq. In. Symbols: E = percentage elongation in 2 in. for tube specimens; e = percentage elongation in 2 in. for flat specimens; D = nominal outside diameter of tube in inches; M = modulus of elasticity (30,000,000 lb. per sq. in.); S = tensile strength (55,000 lb. per sq. in.)

S.A.E. No. 1025 Steel (Normalized), 55,000 lb. per sq. in. tensile strength
S.A.E. No. 2330 Steel (Heat-Treated), 125,000 lb. per sq. in. tensile strength
Duralumin (Heat-Treated), 55,000 lb. per sq. in. tensile strength

It was assumed that the elongation varied as some inverse function of the tensile strength, but their exact relation was not known. This relation was determined approximately by plotting per cent elongation in two inches against tensile strength for 72 different steels[1] as shown in Fig. 7. It was found that this could be turned to a mathematical expression representing the inverse slope 1.2 of a straight line curve. Using the relation (slope 1.2) thus obtained, the elongation values shown in columns (C) and (H) of Tables II, III and IV were corrected to correspond to specified tensile values given above. The numerical difference between the corrected elongation values for tube specimens (column E) and those for flat specimens (column e) are shown in columns E-e of the same tables.

If the assumptions made thus far have been reasonably accurate, it would appear that the quantitative influence the geometric shape of full section specimens has on their elongation is represented by the values (E-e) since the values (e), taken from flat specimens, may be considered a fair index to the ductility of the material as ordinarily measured.

In Figs. 8, 9 and 10 these different elongation values (E-e) are plotted against diameter of tube for each

[1] Values taken from United States Bureau of Standards' Circular No. 101, "Physical Properties of Materials," dated April 23, 1924.

Table III—Comparison of Tube and Flat Specimens of 2330 Steel, Heat-Treated

Nominal Outside Diameter, In.	Nominal Gage Thickness, In.	Ult. Tensile Strength, Lb. per Sq. In., Tube Specimens	Ult. Tensile Strength, Lb. per Sq. In., Flat Specimens	Per Cent Elong. in 2 In., Tube Specimens	Per Cent Elong. in 2 In., Flat Specimens	Corrected Elongation, Tube Specimens	Corrected Elongation, Flat Specimens	Difference in Corrected Elongation for Tube and Flat Specimens
1	0.028	160,000	155,000	6.5	3.5	8.9	5.1	3.8
1 1/16	0.058	152,000	147,000	11.1	7.5	14.1	9.2	4.9
1 1/8	0.042	148,300	158,000	8.5	4.2	10.5	6.6	3.9
1 1/8	0.035	155,000	150,000	8.0	4.5	10.5	5.7	4.8
1 1/4	0.203	142,000	142,000	21.3	15.5	25.0	18.1	6.9
1 1/4	0.058	162,000	162,000	12.0	7.5	16.6	10.4	6.2
1 1/2	0.058	173,000	167,000	9.5	5.7	14.0	8.2	5.8
1 1/2	0.042	155,700	158,000	9.5	4.6	12.5	6.2	6.3
1 1/2	0.035	153,000	155,000	8.5	4.1	11.0	5.3	5.7
1 3/8	0.058	177,000	170,000	9.0	4.8	14.0	7.0	7.0
1 3/8	0.049	165,000	173,000	10.2	5.1	14.5	7.7	6.8
1 3/8	0.042	156,000	152,000	9.3	5.1	12.2	6.8	5.4
1 1/2	0.058	179,300	165,600	12.3	8.0	19.3	11.4	7.9
1 1/2	0.042	151,000	193,000	12.0	4.5	15.3	7.7	7.6
1 1/2	0.187	144,000	140,000	19.0	12.0	22.7	13.9	8.8
1 5/8	0.058	161,000	153,000	12.8	6.1	17.7	8.1	9.6
1 5/8	0.049	144,000	141,000	11.6	5.5	13.9	6.5	7.4
1 5/8	0.120	162,000	156,000	17.0	9.1	23.6	12.0	11.6
1 3/4	0.049	163,000	156,000	13.2	7.1	18.3	9.5	8.8
2	0.058	143,000	126,000	15.6	8.2	18.7	9.1	9.6
2 1/8	0.058	159,000	157,000	13.7	7.5	18.6	9.9	8.7
2 1/8	0.120	171,000	156,000	16.8	10.3	25.0	13.6	11.4
2 1/4	0.187	145,000	142,000	21.7	12.1	26.1	14.2	11.9
A	B	C	D	G	H	E	e	E-e

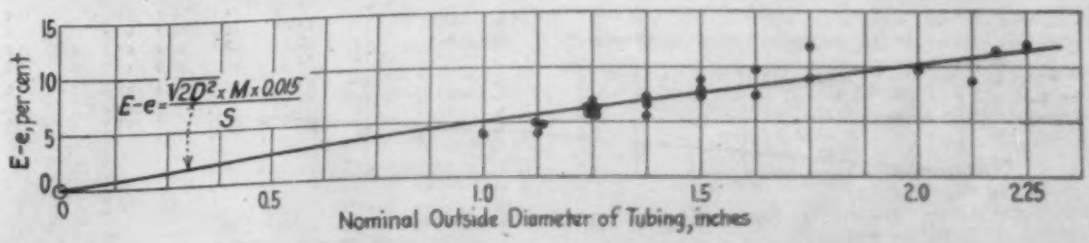


Fig. 9—Material Is S.A.E. No. 2330 Steel (Heat-Treated), Tensile Strength 125,000 Lb. per Sq. In. Symbols: E = percentage elongation in 2 in. for tube specimens; e = percentage elongation in 2 in. for flat specimens; D = nominal outside diameter of tube in inches; M = modulus of elasticity (30,000,000 lb. per sq. in.); S = tensile strength (125,000 lb. per sq. in.)

Table IV—Comparison of Tube and Flat Specimens of Duralumin, Heat-Treated

Nominal Outside Diameter, In.	Nominal Gage Thickness, In.	Ult. Tensile Strength, Lb. per Sq. In., Tube Specimens	Ult. Tensile Strength, Lb. per Sq. In., Flat Specimens	Per Cent Elong. in 2 In., Tube Specimens	Per Cent Elong. in 2 In., Flat Specimens	Corrected Elongation, Tube Specimens	Corrected Elongation, Flat Specimens	Difference in Corrected Elongation for Tube and Flat Specimens
¾	0.040	60,800	60,000	23.0	21.5	26.0	24.0	2.0
⅞	0.040	56,030	56,100	26.0	23.0	26.7	23.5	3.2
1	0.040	61,100	59,700	22.5	20.0	25.8	22.1	3.7
1⅛	0.040	58,000	57,900	23.5	20.2	25.1	22.0	3.1
1¼	0.045	59,600	58,000	26.0	23.5	28.9	25.1	3.8
1¼	0.040	58,200	57,900	23.5	20.5	25.3	21.8	3.5
1⅜	0.040	58,500	57,500	22.6	19.5	24.4	20.5	3.9
1⅜	0.045	60,100	59,700	25.1	21.5	28.1	23.9	4.2
1½	0.051	59,500	59,800	25.5	21.5	28.1	23.8	4.3
1½	0.045	61,000	59,900	24.0	20.0	27.2	22.2	5.0
1⅝	0.051	61,400	60,300	25.6	21.5	29.5	24.2	5.3
1¾	0.057	60,500	57,700	25.5	21.5	28.8	22.8	6.0
1¾	0.045	58,000	61,400	24.0	18.1	25.5	20.9	4.6
1¾	0.051	61,000	60,000	26.9	21.5	30.5	24.0	6.5
1⅞	0.057	57,000	57,700	28.6	22.1	29.9	23.5	6.4
A	B	C	D	G	H	E	e	E-e

material examined. It was found that these data could be closely approximated by an empirical formula. The curves drawn through these data clearly indicate that, for a given material, the most influential factor is the tube diameter. It was also found that, in working from one material to another, the empirical formula could be expended to represent all three materials thus:

$$E\text{-}e = \frac{\sqrt{2}D^2 \times M \times 0.015}{S}$$

where E — elongation of full section specimen (per cent in 2 in.)
e — elongation of flat specimens (per cent in 2 in.)
D — outside diameter of tube (in.)
M — modulus of elasticity (lb. per sq. in.)
S — tensile strength (lb. per sq. in.)

The curves shown were plotted from this formula.

The quantity $\sqrt{2}D^2$ in the above formula was left in this form to show its approximation to the radius of gyration of the tube. How the modulus of elasticity, being an elastic property of the material, affects the elongation which is a plastic property, cannot be readily explained. Fig. 11 may shed some light on this point in which it will be noted that, in the failure of a steel tube, the principal reduction in diameter occurs at the point of fracture whereas for duralumin tubes a majority of the reduction in diameter occurs at the plug. It may thus be that, in the early stages of the test, the elastic properties, or stiffness of the material, control the point of greatest deformation.

The influence of such variables as gage thickness, ratio of tube diameter to distance between plugs (in the case of full section specimens) and ratio of gage thickness to gage length are of minor importance when compared to the influence of the tube diameter. This is borne out by the reasonable agreement of these data with the empirical curves shown.

It is evident that current specifications and practice are decidedly in error which permit a direct comparison between tensile properties obtained from full section tube specimens and those obtained from flat specimens cut from the same tubes. Indeed some specifications require greater elongation for small diameter tubes than for larger ones.

This again reminds us of the very great need for standard test specimens and methods designed as scientifically accurate as knowledge affords which could be calibrated for conditions and materials they are to represent. Such accuracy is not required in all testing work; however, reliable standards are a very necessary thing in setting tolerances and allowances for routine tests. Our weights and measure systems are very good examples of the utility of fixed standards.

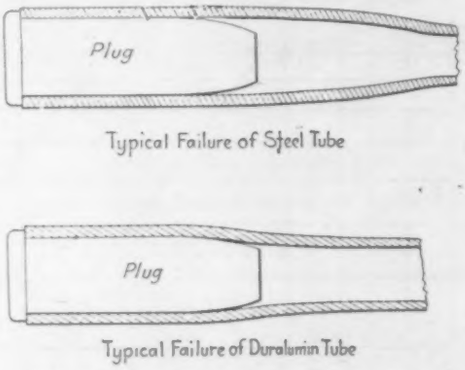


Fig. 11—Typical Failures of Steel and Duralumin Tubes

The writer is indebted to the management of the Naval Aircraft Factory for encouraging this work and the Naval Intelligence Bureau for permission of publication.

Actual Cast Iron Pipe Increase in 1925 Was 4.5 Per Cent

An editorial in THE IRON AGE of July 29 on "High Output of Pipe and Tubes" stated that "from 1913 to 1925 production of cast iron pipe fittings increased 84 per cent, to 2,324,047 net tons or 2,075,042 gross tons." The statement was based on the statistics for last year, published by the American Iron and Steel Institute. However, the writer of the editorial had overlooked the fact that revised figures recently issued by the institute showed that the output of cast iron pipe in 1925 was 1,924,735 tons, a reduction of about 400,000 tons from that originally published. The error was in the production of gas and water pipe, including culvert pipe. The institute's revised total for such pipe was 1,414,252 tons, whereas the original figure was 1,813,564 tons. Adding to this the figure for soil and plumbers' pipe, which remained unchanged at 510,483 tons, gave the total of 1,924,735 tons. We regret the repetition of the incorrect figure in THE IRON AGE, since it has led to some exaggerated statements in financial reviews concerning the expansion of the cast iron pipe industry in the past year. The actual increase over the 1924 output (1,841,350 net tons) was 4.5 per cent; but 1924 had made an unusual record, being 20 per cent above the best previous year.

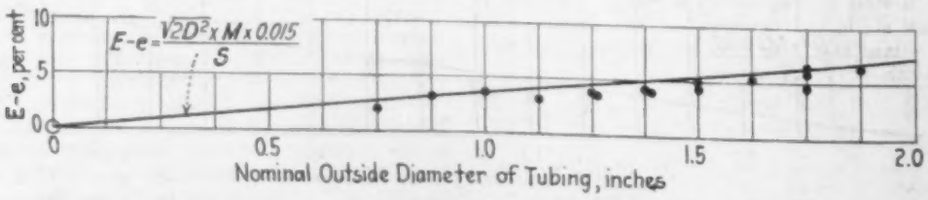


Fig. 10—Material Is Duralumin (Heat-Treated), Tensile Strength 55,000 Lb. per Sq. In. Symbols: E = percentage elongation in 2 in. for tube specimens; e = percentage elongation in 2 in. for flat specimens; D = nominal outside diameter of tube in inches; M = modulus of elasticity (9,750,000 lb. per sq. in.); S = tensile strength (55,000 lb. per sq. in.)

Silicon as an Alloy in Steel[1]

German "Freund" Steel Compared With Other Steels of Similar Composition—Effect of Silicon, Manganese and Nickel—Use for Structural Purposes

BY DR. H. W. GILLETT[2]

GERMAN structural engineers, especially those of the Deutsche Reichsbahn Gesellschaft, are showing a good deal of interest in a "new" low-carbon high-silicon structural steel known as "Freund," or "F," steel which the Aktien Gesellschaft Freund first produced in 1925 by melting in the Bosshardt furnace. Extensive study of the steel was carried on by the Verein Deutscher Eisenhüttenleute, and reported in *Stahl und Eisen*[3] and in the *Zeitscrift des Vereins Deutscher Ingenieure*[4].

Their work was aimed not only to study the properties of the steel and its behavior in rolling, but also to show whether or not it could be successfully made in furnaces other than the Bosshardt. Their conclusion was that it could be, and their data show quite definitely that it can be made in the open-hearth or the electric, and probably even in the converter.

The Bosshardt furnace is a special, patented form of open-hearth furnace, so far only built in a 3-ton size, which is said to be operated at an extraordinarily high temperature. The claim has been made that the high furnace temperature is responsible for the properties of the steel and for its alleged freedom from oxygen.

Discussion still rages in Germany as to the need for the Bosshardt furnace and while the Deutsche Reichsbahn Gesellschaft is having a 10-ton Bosshardt furnace installed at the Linke-Hofmann-Lauchhammer A. G. for a more extended comparative test, the general opinion seems to be that the analysis is the essential thing and not the production of F-steel in a Bosshardt furnace.

This is the more probable because work done in Italy upon steel whose composition and properties practically coincide with those of the "new" steel was described by Paglianti[5] 14 years ago, and steels varying but little in composition and properties were used in England, in the steamships Mauretania and Lusitania, about 20 years ago. Similar American steels made for the Navy were reported on by Bisset in 1910[6]. All these were of course made in ordinary types of furnaces.

The term "new" applied to the "Freund" steel appears to be a misnomer as regards metallurgical knowledge of steel of high-silicon content, although quantity of production of high-silicon steel of quite as low a carbon content as the Freund composition does not yet appear to have been undertaken outside Germany.

The effect of silicon in structural steel has been on record as a result of the work of Tetmajer, published in 1884, and of that of Guillet in France, Sir Robert Hadfield and Thomas Turner in England, before 1900, as well as of many other workers in more recent times. Especially in view of Paglianti's work, it is difficult to see how any claim to "newness" of the Freund steel could be substantiated, nor have any patents been cited that deal with the composition.

Since it would thus appear that no patent on the composition and no requirement of a special furnace would lie in the road to commercial manufacture of the high-silicon steel, attention may be concentrated upon the properties and usefulness of steel of that type.

Tests of Freund Steel

Specimens of five heats of Freund steel were submitted to the Bureau of Standards for test and, while they were insufficient in number to establish by themselves the properties of such steel, the results of the tests are in general agreement with several extensive German tests. A full account of the tests and a comparison with the German data are to be issued as a technologic paper of the Bureau of Standards, in which published work on high-silicon steels is reviewed. Only a very brief abstract of the information available on this type of steel can be given in the space here allotted.

The outstanding feature of the steel is its composition, about 1 per cent silicon and not over 0.15 per cent carbon, the combination giving a high yield point and high ductility. The properties of the steel are compared with those of other structural steels in the table, from which it will be seen that high yield point and high ductility may, with sufficiently low carbon, be obtained by raising either manganese or silicon or by the use of nickel.

Nickel in American Practice

American practice has been to raise the yield point by the use of nickel, or, as in the Delaware River Bridge (see M in the table) to use a little silicon and much more manganese, without materially reducing the carbon from the percentage used in unalloyed structural steel.

Considering only the cost of the alloying elements, silicon is sometimes more expensive and sometimes cheaper than manganese. If large scale manufacturing tests, needed to establish the cost of production, should show that the cost of finished low-carbon silicon steel would be less than that of structural manganese steel at periods of high prices for manganese and low prices for silicon, it would appear that American manufacturers might well consider being prepared to make the silicon steel.

German engineers appear to be satisfied with the properties of the steel but they require further information on the cost of the steel when made in regular large-scale production. Since German steel makers are actively working to obtain that information, it seems probable that the steel will soon be in commercial use in Germany, and its export in competition with American steels may ultimately be expected.

From the German data and the Bureau of Standards tests, the properties of the steel make it seem suitable for ordinary structural use. The claim that oxygen is absent was not substantiated either in the German or the bureau tests. The steel was evidently treated with aluminum, and carried too many nonmetallic inclusions to make it promising for exacting use under repeated stress.

Notwithstanding the "dirtiness" of the German steel, it gave 58 to 86 ft.-lb. in the Izod impact test, and the specimens did not break completely apart. The proportional limit of the specimens tested at the Bureau of Standards, (using a Ewing extensometer on an 8-in. test length) ran from 49,000 to 57,500 lb. per sq. in., and averaged 53,000 lb. The steels contained up to about 0.20 per cent copper and up to 0.15 per cent

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[1] Published by permission of the director of the United States Bureau of Standards.

[2] Chief division of metallurgy, Bureau of Standards.

[3] Vol. 46, 1926, page 493.

[4] Vol. 70, 1926, page 861.

[5] *Metallurgia*, Vol. 9, 1912, page 217.

[6] THE IRON AGE, Aug. 25, 1910, page 442.

[7] Burgess, G. K.—*Transactions* American Society of Civil Engineers, Vol. 86, 1923, page 1292.

Table of Properties of "Freund" and Other Steels

	C	Mn	Si	Ni	Cr	Yield Point, Lb. per Sq. In.	Tensile Strength, Lb. per Sq. In.	Elongation, Per Cent in 8 In.	Reduction of Area, Per Cent	
A.	0.13	0.62	1.05	...	0.08	56,500	76,000	25	63	
B.	...	...	...	...	...	48,500	68,500	22	45	
C.	0.13	0.56	0.74	...	...	59,500	75,500	27½	68½	Low-carbon silicon steels of "Freund" composition.
D.	0.13	0.53	0.83	...	...	55,500	72,500	27	61	
E.	0.12	0.46	1.00	...	...	54,500	70,500	22½	48	
F.	0.11	0.36	0.95	...	...	53,500	69,000	28	55	
G.	0.15	0.50	1.25	...	...	60,000	78,500	28	45	
H.	0.24	0.46	0.74	...	...	52,500	82,500	26	55	High-carbon silicon steels.
I.	0.27	0.72	1.12	...	...	62,500	92,000	25	45	
J.	0.19	0.70	...	3.48	...	49,000	76,000	23½*	67	Annealed nickel.
K.	0.38	0.58	...	3.45	...	60,000	100,000	18	33½	Nickel.
L.	0.35	0.70	...	1.49	0.45	56,000	90,000	13	..	Nickel-chromium, annealed and normalized.
M.	0.31	0.96	0.29	...	...	52,500	90,500	25	48	
N.	0.34	0.57	0.22	...	...	46,500	79,000	25	52	Plain carbon, with some silicon.
O.	0.10	1.77	0.31	...	...	60,000	82,500	26	54½	High manganese, low carbon.
P.	0.12	0.44	tr.	...	...	36,000	50,000	44*	72	Plain low-carbon rivet steel.
Q.	...	...	...	...	...	30,000	55,000	25½	..	Specification, structural.
R.	under 0.44	...	over 0.18	...	...	45,000	80,000	18½	30	Specification "silicon"—structural.
S.	...	...	...	...	...	36,000	55,000	..	..	German "No. 37."
T.	...	...	...	...	...	40,500	72,500	..	..	German "No. 48."
U.	...	...	...	...	...	44,500	76,000	25	..	German "No. 58."

*In 2 in.

A. Average of tests on 5 heats of "Freund" steels made at Bureau of Standards.
B. Minimum figures for "Freund" steel from German tests.
C. German test on electric silicon steel.
D. German test on open-hearth silicon steel.
E. German test on open-hearth silicon steel.
F. Paglianti's silicon steel—1912.
G. Paglianti's silicon steel—1912.
H. Bisset's silicon steel, 1910—see footnote 6.
I. Steel in Mauretania, minimum figures given by Hadfield, R. A., "Metallurgy and Its Influence on Modern Progress," 1926 edition, page 114.
J. Annealed nickel—see Krebs, F. W.—Mech. Eng. 48, 1926, page 448.
K. Nickel steel, St. Louis Bridge } see Burgess, G. K., footnote 7.
L. Nickel-chromium (Mayari) steel, Memphis Bridge }
M. High-manganese structural steel, Delaware River Bridge—Bureau of Standards test.
N. Plain carbon structural steel, Delaware River Bridge—Bureau of Standards test.
O. High manganese low carbon steel—see Lang, G.—*Stahl und Eisen 31*, 1911, page 181.
P. Rivet steel—average—phosphorus and sulphur committee tests—Proc. A.S.T.M. *22*, (1) 1922, page 108.
Q. Structural steel for buildings—A.S.T.M. Specifications A-9-24.
R. Structural steel, tentative A.S.T.M. specification, A-9-25T for "silicon" steel.
S. T. U. Minimum figures for three grades of German structural steels reported by Graf and by Gehler—see *Bauingenieur* 7, 1926, page 277, and 5, 1924, page 630.

chromium, neither one intentionally added. Some German analyses show a little nickel, also adventitious, from the scrap used. The steel is a little lighter than ordinary structural steel, the specific gravity averaging 7.78 against 7.84 for the ordinary material.

If, as seems probable, engineers in this country come to designing statically stressed structures on the basis of the yield point of the steel, as is being done in Germany, a demand for material having a higher yield point will grow up here just as it has in Germany. With such a demand, the problem of the steel maker will become how to produce such material at the lowest possible cost.

The Cheaper Alloying Elements

The possibilities of the cheaper alloying elements, in steel to be used as rolled, as well as in the heat-treated condition, deserve more attention than has heretofore been given them. Manganese is already gaining recognition as the alloying element it really is. The amounts of silicon ordinarily used have generally been considered as having relatively little effect upon strength. Yet, by raising the silicon content to around 1.00 per cent, one can raise the yield point of a 0.13 per cent carbon steel from 36,000 to 56,000 lb. per sq. in., retaining good ductility (elongation of 25 per cent in 8 in. and a reduction in area of over 60 per cent). Hence its influence as a potent alloying element can scarcely be denied.

Reaching this yield point by raising the carbon involves a sacrifice in toughness and ductility. Reaching it by adding nickel increases the expense. If the choice of alloying element lies between manganese and silicon, and if the carbon content must be held low, the lower carbon content of ferrosilicon as compared with ferromanganese adds another advantage on the side of silicon.

Burgess[7] has called attention to the possibility of using both silicon and manganese in adjusted composition, according to the prevailing prices of the elements, but recent American practice seems to have neglected the possibilities of silicon.

Apprenticeship Study of Chamber of Commerce of the United States

A relation between employer and minor wherein mutual obligations and duties are agreed upon (usually in writing—the indenture) by both parties concerned, is one definition of apprenticeship set down in a 50-page pamphlet issued by E. W. McCullough, manager of the department of manufacture of the Chamber of Commerce of the United States, and prepared by Robert H. Spahr. The publication does not attempt an exhaustive study, but offers valuable information selected from the experiences of such States as Wisconsin and Massachusetts, where State supervision has made great strides in the training of future skilled workers in the trades.

The impression prevails, but the pamphlet points out that it is a mistaken one, that the training of apprentices is a monopoly of the large company. With the aid of community or State cooperation the small company as well as the large may do its share without facing the prospect of losing the youth it has trained to a larger concern. A conclusion emphasized by the study is that, even though the employer and the labor union are willing to devote time to apprenticeship, the intervention of a third party, usually the State, has been necessary to formulate a definite working plan. Nor can the prospective apprentice be neglected. He must first be won to the idea and then rewon by the employing company, if he is to lay hold of the opportunities which are his and translate them into a future of high achievement.

Among interesting statistical statements is the one that carpenters may expect about 70 per cent employment, also that bricklayers average about 180 days per year, and a third one—that 3300 carpenters came to the United States from Europe in 1923. Of 25 well known industrial companies named as maintaining apprentice schools, 23 are in the steel and metal-working trades.

Large Ferroalloy Output in South

Producer of 50 Per Cent Ferrosilicon Is Heavy Consumer of Hydroelectric Power—Plant Operated Continuously on Three 8-Hr. Shifts

THE largest consumer of electric power in Chattanooga is the Southern Ferro Alloys Co., manufacturer of 50 per cent ferrosilicon. Out of 147,322,398 kwhr. furnished by the Tennessee Electric Power Co. to Chattanooga industries for power purposes last year, this one company used over 20 per cent.

Load Factor Averages 96 Per Cent

Having an annual capacity of 7500 tons of 50 per cent ferrosilicon, the plant runs continuously in three 8-hr. shifts with a load of 5000 to 5200 kw., or 120,000 to 124,800 kwhr. per 24 hr. The load factor is very high, averaging 96 per cent.

The plant, which occupies a tract 175 x 330 ft., is equipped with three open-top electric furnaces, two taking 3-phase current and rated at 2400 kw. and 1800 kw. respectively, and a third on single-phase current rated at 850 kw. The two larger furnaces have three electrodes each, and the 850-kw. furnace has two electrodes. The 2400-kw. furnace uses electrodes 24 in. in diameter and 8 ft. in length, weighing over 2000 lb. apiece. The two other furnaces are equipped with 20-in. electrodes. The electrodes are manufactured from a carbon mixture by the National Carbon Co., Niagara Falls, N. Y.

Suspended above the furnace, the electrodes extend into the raw materials with which the furnace is filled. As their lower ends are slowly consumed, the electrodes are fed into the furnace. About 10 in. of each electrode is used up daily. The top of each electrode is threaded and fitted with a plug over which a new electrode is screwed when the electrode in use has been largely consumed. This plan saves the butt ends of the electrodes. The electrode holders are heavy copper pipes, which convey both current to the electrodes and water for cooling the electrode clamps.

Silica Is Reduced at 6000 Deg.

The load on the furnaces is automatically controlled by Thury regulators. The current is received at 6600 volts from the public utility and is stepped down to 85 volts. For the single-phase furnace there is an 833-kva. water cooler transformer, furnished by the Pittsburg Transformer Co.; for the 2400-kw. furnace there are three 833-kva. transformers supplied by the same company. The Westinghouse Electric & Mfg. Co. furnished three 650-kva. air-cooled transformers for the 1800-kw. furnace.

The raw materials used are high grade silica rock (averaging about 98½ per cent silica), coke breeze, for reducing the silica to silicon, and heavy steel turnings, bought largely from the railroads, for the iron which combines with the silicon. The reduction of the silica takes place at a temperature of about 6000 deg. Farh. The furnace shell is of steel, with a first lining of fire brick and a second of carbon.

Shipped Largely in Bulk

Tapping is at intervals of 1 hr. or 2 hr., according to the size of the furnace. The yield per tap ranges from 1300 lb. of 50 per cent ferrosilicon from the 2400-kw. furnace to 650 lb. from the 850-kw. furnace. The tap runs out on silica sand in pancake-like form. When it is cold it is lifted by crane hooks and transferred to an industrial car. It is then rolled alongside a railroad spur, which runs into the plant, where sand is removed from the ferrosilicon with a wire brush. The ferrosilicon, when stone cold, is very brittle and is easily broken with a hammer into brick-

The Open-Top Furnaces Are Charged Continuously With Silica, Coke Breeze and Heavy Steel Turnings. The ferrosilicon is tapped at intervals of 1 hr. to 2 hr., according to the size of the furnace

Silica Rock and Coke Are Discharged From Railroad Cars Through a Track Hopper to a Belt Conveyor, Which Transfers Them to an Elevator. The elevator raises them to a two-way spout, which is set to discharge the silica and coke into separate storage bins

sized lumps. Most of the ferrosilicon is shipped in bulk in box cars, and numerous samples from each carload are analyzed by a chemist. Small quantities are shipped in sacks.

Facilities for Handling Raw Materials

The plant is located on the Nashville, Chattanooga & St. Louis Railway, but through belt railroad facilities is connected with all the other railroads entering Chattanooga. Silica rock and coke are received in carloads and discharged through a track hopper to a belt conveyor, which transfers them to an elevator. The elevator raises them to a two-way spout. The spout is set so that rock is discharged in one direction and coke in another into separate storage bins. One to two cars a day of coke, silica and steel are consumed.

Charges for the furnace are carefully analyzed, weighed and mixed. As previously indicated, the furnaces are charged continuously. The coke, silica and steel, mixed in proper proportions, are shoveled into the furnace around the electrodes, while the molten ferrosilicon produced collects in the bottom of the furnace. After each tap, the tap hole is plugged up with a tapered cone, made of fire clay mixed with coal dust, which is mounted on the end of a steel rod.

Water for Electrode Holders Cooled in Tower

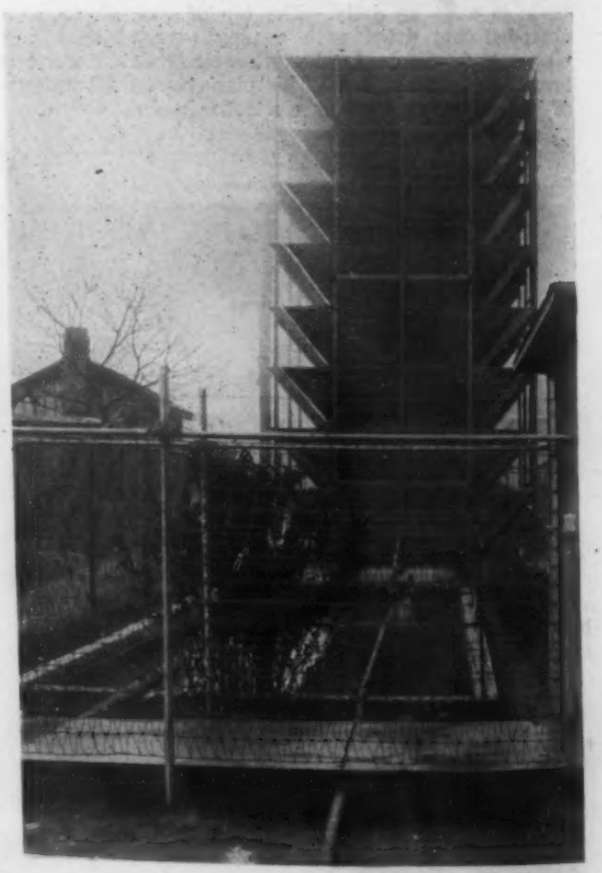
Cooling water employed in the pipes of the electrode holders is used over and over again. It is in continuous circulation, passing from the holders to a cooling tower located at the rear of the plant property. Hot water is pumped to the top of the tower, passing down through a series of decks where it is exposed to the open air. The only loss in the water circulation system is through evaporation.

The Southern Ferro Alloys Co. is the only producer of 50 per cent ferrosilicon in the South. Its location at Chattanooga was primarily prompted by the availability of hydroelectric power and of the raw materials described. Even in 1925, a dry year which adversely affected the generation of hydroelectric energy, the company used 13,000,000 lb. of silica rock, 6,000,000 lb. of steel and 7,000,000 lb. of coke. The company was incorporated under the laws of Tennessee in April, 1917. Its principal officers are George L. Davison, vice-president and plant manager, and Paul J. Kruesi, president.

Greater Output per Manufacturing Operative

It has been generally accepted that employment fluctuates with production, on the assumption that, barring revolutionary changes in methods, a given labor force is necessary to produce a certain output. This was substantially true, according to the National Industrial Conference Board study of employment and production, from 1900 to 1914. But since then employment in manufacturing has to an increasing degree failed to keep pace with the increase in output, and this tendency has become particularly noticeable since 1921. Although the volume of manufacturing output from 1921 to 1925 increased about 62 per cent, employment during the same period increased only 14.28 per cent.

But inasmuch as employment indexes are computed on data from a number of selected plants, the board cautions that it does not accurately measure total employment and hence is not strictly comparable with fluctuations in total volume of production as indicated by the production index. Moreover, employment indexes, being based on payroll data, do not take into account part-time work nor overtime work, indicating merely the number of employees on the payroll. However, the difference of fluctuations between volume of production and employment since 1921 is so marked and is substantiated to such an extent by the experience in individual plants that the conclusion of a great saving in human energy in manufacturing production cannot be escaped.



Cooling Water Employed in the Pipes of the Electrode Holders Is in Continuous Circulation, Passing to a Cooling Tower Where It Is Exposed to the Air on a Series of Decks

Fire Test of Steel Joist Floor Panel

Report Shows High Resistance to Deformation—Slab Loaded to Represent Working Condition—Bar Strength Retained

TEST of a light-weight floor panel, consisting of Massillon bar joists* supporting a 2½-in. concrete slab above and ¾ in. plaster on metal lath below, was made by the Pittsburgh Testing Laboratory to determine the fire resisting properties of a typical panel built up in this manner. The panel included five of the bar joists spaced 16 in. on centers and with a clear span of 10 ft. 6 in. This panel was placed across the top of a furnace with inside dimensions of 6 ft. x 10 ft. 6 in., and 5 ft. high, the brick furnace wall being 13½ in. Heat was supplied by six oil burners located

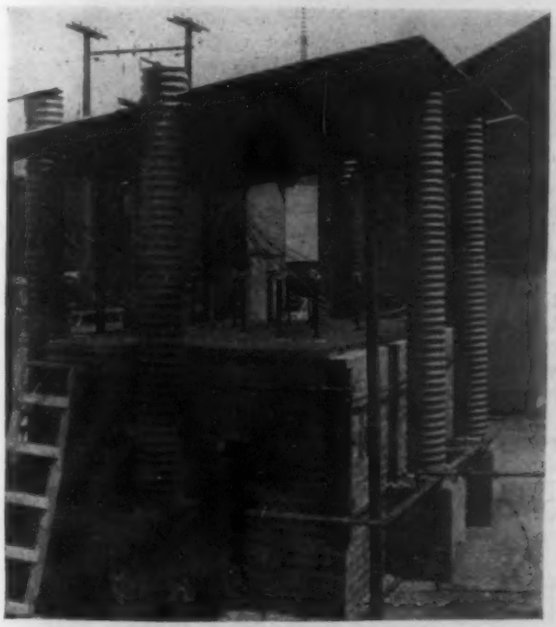


Fig. 1 (Above) Is a General View of Furnace and Floor Panel. The corrugated pipes are chimneys. The thermocouples show above floor
Fig. 2 (Upper Right) Shows Method of Attaching Thermocouples to the Floor Panel
Fig. 3 (Right) Shows Loading of Panel to 127 Lb. Per Sq. Ft.

symmetrically around the furnace, with center lines 2 ft. below the slab being tested. Furnace gases were discharged through six flues of corrugated metal about 12 in. in diameter, extending well above the floor plate, as shown.

Each bar joist consists of upper and lower members, steel bars, with lattice stays between them. Joints are made by electric arc welds. At each end the lower member comes up, at an angle, fairly close to the upper member, as shown in the line cut. A bearing is made here by insertion of a short strip of steel, welded to both upper and lower members.

Behavior of Steel When Heated

Raising the temperature of a steel beam 20 ft. long to 1600 deg. Fahr. increases its length, through expansion, about 3 in. Such a member, heated on one side only, expands on that side, causing distortion or buckling toward the heated side. Such a beam rigidly fixed at its ends and heated, either uniformly or otherwise, is distorted through the resulting expansion. A beam loose at one or both ends and uniformly heated expands longitudinally without distortion. Consequently a beam resting on brick walls will successfully withstand greater temperature than one riveted to columns.

While high temperature will rob a steel member of both its ultimate strength and its elastic limit, it is found that the temperature can be raised to nearly 900 deg. Fahr. while retaining substantially the normal strength. There is a moderate decrease in strength between 150 and 400 deg., followed by a substantial increase between 400 and 850 deg., this increase reaching a maximum of about 15 per cent at 600 to 700 deg.

Fireproofing of structural members must be such that (1) any heat which reaches a structural section in a building should be uniformly distributed over the entire area and (2) the members should be free to expand as heat is applied, or they should be so protected as to permit only moderate increase in temperature.

Observations on Test

Deflection of the panel tested was observed by means of a transit focused on a scale fastened on the center of the slab. Temperatures were recorded by means of 14 thermocouples, one of which was run down into the furnace space, while the other 13 ran through the concrete floor slab and had their sensitive ends in the air space surrounding the bar joists. After all the thermocouples had been installed the slab was loaded uniformly to 127 lb. per sq. ft. of area. This loading is shown in Fig. 3, which shows also the leads from many of the thermocouples running through it. The connections of these thermocouples and the manner of passing them through the slab is shown in Fig. 2, while Fig. 1 is a general view of the furnace and slab before the load was applied.

About 45 min. was required, after lighting the burners, to bring the temperature up to the 1800-deg. mark maintained throughout the test. A further pe-

*Made by the Massillon Steel Joist Co., Canton, Ohio, and tested at Canton.

riod of 3 hr. 40 min. at full heat was occupied by the test, with temperature and deflection readings every few minutes. The average of the furnace temperature readings over this latter period was 1792 deg. The average of the deflections during the last 3¼ hr. of the test (after deflection had become approximately uniform) was 0.686 in. in the middle of the panel.

Reporting upon the test, the laboratory engineer states that the steel bars, after undergoing this treatment, showed the same strength as before the test. Another section of bar, tested at a temperature of 875 deg., which represented the maximum to which it was subjected at the end of the heating period, showed about 85 per cent of its original tensile strength.

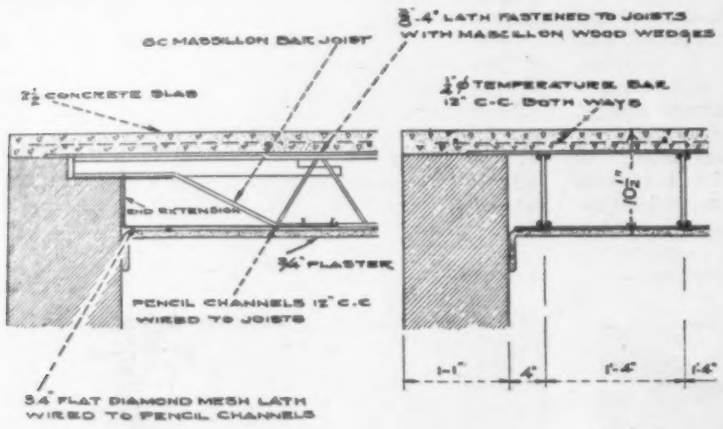


Fig. 4—Construction Details of the Floor Panel. The joists (Massillon Type 8 C) consist, in each case, of four continuous bars, two at top and two at bottom, with lattice spacers welded on. Bearing surface is obtained at each end by a strip of steel welded between the continuous bars, of which the two lower ones are brought up at an angle for this purpose

Deducting the 0.25 in. produced initially by the loading before the furnace was lighted, the deflection due to the high temperature was 0.436 in.

During this portion of the test the temperature in the air space increased continuously from 466 deg. at the time the furnace had reached its pre-determined temperature to 872 deg. at the end of the test. These were averages of readings of 13 thermocouples. The temperature on top of the concrete slab at the expiration of the test was between 160 and 170 deg., while 2 hr. earlier it was 140 deg.

"After discontinuance of the high temperature the original full strength of the joists is retained," he reported.

When the concrete slab was removed from above the joists a permanent deflection in them was noted, including both a slight sagging and a lateral distortion. All five of the joists, however, were tested for transverse strength after the fire was over and withstood a load equivalent to twice their rated load. "This evidenced that the strength of the floor slab had not been impaired," according to the report.

Ohio Foundrymen to Hold Annual Meeting

An interesting program has been prepared for the annual meeting of the Ohio State Foundrymen's Association to be held in Cincinnati, Sept. 16 and 17. Some of the problems of the non-ferrous foundry will be discussed by Fred L. Wolf, technical superintendent Ohio Brass Co., Mansfield, Ohio. Herman Schneider, dean at the University of Cincinnati, will discuss the value and advantages of research. E. J. Lowry, Hickman, Williams & Co., will discuss "Rational Cupola Melting." George A. Richardson, Bethlehem Steel Co., Bethlehem, Pa., will give a talk on the various grades of pig iron and their respective advantages.

Greatest 6 Months' Freight Record

During the first six months this year the railroads of this country handled the greatest freight traffic they were ever called upon to move during any corresponding period, according to reports just filed by the carriers with the Bureau of Railway Economics. This traffic amounted to 227,116,889,000 net ton-miles, exceeding by 1,632,421,000 net ton-miles or 0.7 per cent the best previous record, made during the first half of 1923.

The volume of freight handled in June was also the greatest for any June on record, amounting to 39,236,630,000 net ton-miles. This exceeded by 758,630,000 net ton-miles or 2 per cent the best previous June, which was in 1917, while it also exceeded by 9.4 per cent that for June, 1925.

The daily average movement of freight cars in June was the highest for any June on record, amounting to 30.1 miles per day. This was an increase of 1.7 miles over the best previous June, which was in 1917 and was an increase of 2.6 miles over June last year.

The average load per car in June was 27.3 tons, an increase of 0.4 ton over June last year and 0.6 ton above June, 1924. June, 1923, however was 0.9 ton higher.

Institute of Metals Meeting in Belgium in September

For the meeting of the Institute of Metals at Liège, Belgium, Sept. 1-4, the following are among the papers scheduled:

"The Deformation of Tungsten Crystals," by C. J. Smithells, H. P. Rooksby and W. R. Pitkin.

"A Comparison of Static and Dynamic Tensile and Notched-Bar Tests," by Prof. Kotard Honda.

"The Constitution and the Physical Properties of the Alloys of Cadmium and Zinc," by C. H. M. Jenkins.

"Some Further Experiments on the Behavior of Single Crystals of Aluminum under Reversed Torsional Stresses," by H. J. Gough, S. J. Wright and D. Hanson.

"Silumin and Its Structure," by Buntaro Otani.

"The Primitive Copper Industry of America—Part II," by G. Brinton Phillips.

"The Constitution and Age-Hardening of Some Ternary and Quaternary Alloys of Aluminum containing Nickel," by E. Kathleen Bingham.

"The Constitution and Structure of the Commercial Aluminum-Silicon Alloys," by A. G. C. Gwyer and H. W. L. Phillips. With an appendix upon "The Properties of the Modified Aluminum-Silicon Alloys," by D. Stockdale and I. Wilkinson.

"Some Mechanical Properties of Silicon-Aluminum Alloys," by J. D. Grogan.

"The Action of Hydrogen on Hot Solid Copper," by Cyril S. Smith and Prof. Carle R. Hayward.

"The Development of the Use of Nickel in Coinage," by Capt. F. R. Barton.

"Season-Cracking in Arsenical Copper Tubes," by A. Pinkerton and W. H. Tait.

"Thermal Anomalies of Certain Solid Solutions," by Prof. P. Chevenard.

"Preliminary Experiments on the Copper-Magnesium Alloys," by W. T. Cook and W. R. D. Jones.

"Bronze Worm Gear Blanks Produced by Centrifugal Castings," by F. W. Rowe.

"An Account of the Non-Ferrous Metals Industry in the Liège District," by L. Boscheron.

The Car Packed Ready for the Attachment of the Lid. Note the wheels resting on the running board

Steel Case for Exporting Automobiles

Substitution of Steel for Wood May Permit Reduction in Ocean Freight Charges and Insurance—Chances of Injury Diminished

ANOTHER substitution of steel for wood has appeared in a collapsible steel case to pack automobiles for export shipment. The case may be returned to the shipper for further use. The case is a development of A. J. Berg of the Collapsible Metal Case Corporation of America, 15 Moore Street, New York. The General Motors Exporting Co. recently shipped an Oakland touring car to Antwerp in one of these cases, and the result is stated to have been satisfactory enough to warrant their being placed on the market immediately.

It is Mr. Berg's plan to make the cases for renting to automobile manufacturers, and a contract for their building is about to be let at this writing. With this arrangement the user will not have to face loss by scrapping which might arise if a radical body change rendered the case useless for his product.

The cases are to be built of 3/32-in. corrugated steel panels, riveted to an outer frame of 3/8-in. flat steel which will provide rigidity to the case as well as a means for fastening the panels together. As may be seen in one of the accompanying photographs, the framework will be convex with the exception of the extreme edge, which is turned straight outward to form an angle of 45 deg. with the plane of the panel of which it is a part. This outer edge, approximately 1½ in. wide, provides a joining surface by which the panel is bolted to the adjacent unit.

It is claimed by the inventor that this fastening will eliminate the need for using slings about a case in hoisting operations to and from the dock. Chime clamps similar to those used in lifting drums or barrels will grip the edge readily, and it will not be necessary to use crowbars to raise the case with the attendant possibility of injury to the vehicle inside.

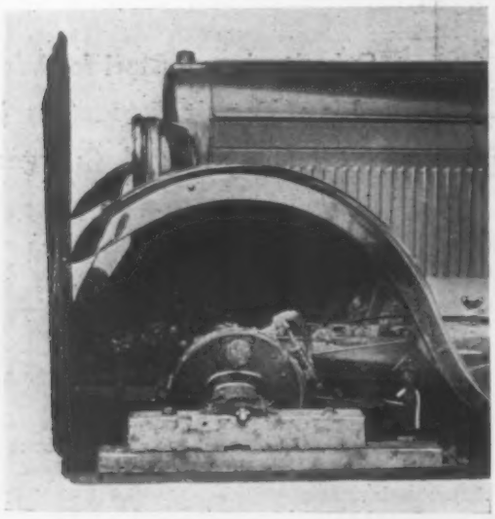
The width of the cases must correspond to the standard width of motor cars, but changes in models may require variations in the other dimensions. To meet this exigency Mr. Berg has developed additions of varying widths which may be inserted at the joints when necessary. The method of attachment is the same used in the connection of other units.

In reducing length and height the corrugated panels are removed from the frames and reriveted on the outside instead of the inside as originally. As the corrugations in the panels are ¾ in. deep and securing the panels to the inside instead of to the outside of the frames reduces each dimension by twice the thickness of the joint at this point, length or height may be diminished to the extent of 2 in. This may serve to fit the case to a new model.

Dismantling and packing a car in the steel case,

Shows the Car Secured to the Bottom of the Case with the Sides Ready to Be Bolted into Place

it is found, requires approximately 3 hr. After the wheels have been removed, the springs tied down with bolts and the steering post and windshield removed, the car is lowered upon the bottom of the case in such a manner that the ends of the axles, previously wrapped with burlap, will fit into grooves provided in anchor blocks which have been bolted to the bottom at each corner of the case. These blocks may be placed on either side of the brake drum, according to the desire of the packer. Gooseneck bands as illustrated are then bolted over the axle to secure the car in its place. Steel rods bent on one end to fit the shackles



Wood Blocks Bolted to the Bottom of the Case Form a Method of Attachment for the Axles

on the springs and threaded at the other for bolting through the bottom may be used at the corners as a precaution against side play.

Two wheels are next bolted through each side member of the case in such a manner that they will rest on the running board of the car. All nuts used in bolting are secured in the concave part of the corrugated sides and thus protected from damage by the two adjacent convex members. The side, end and top panels are then bolted into place with the aid of power-driven wrenches, and the case is ready for shipment. As the cases are made up of six similarly constructed units, they may be placed one inside the other to provide convenience in return shipment to the user.

With the bolts properly secured the peculiar design of the edges is said to render each joint airtight and watertight. The possibility of "inside sweating" under certain atmospheric conditions is thought by the inventor to have been eliminated by the use of a bitumastic paint similar to that applied with success to the interiors of steamships.

In the matter of insurance it is supposed that lower rates may be secured on steel-cased automobiles. The fire hazard incident to shipping in wood is eliminated almost entirely. The cases may be secured against pilferage by cutting the threads of a few of the bolts, and any indication of damage would plainly be visible on the outside of the case, assuring prompt establishment of liability. The construction of the case is so firm that denting or bending in shipment is thought to be improbable, and the possibility of pressure over a wide area on the surface injuring the more exposed parts of the car is reduced.

The weight of the case as it will be built is approximately 1500 lb., or 150 lb. more than the corresponding wood container. Weight has little significance in ocean shipping, where rates are based on the number of cubic feet occupied, but would become an important factor if the crated vehicle or the crate itself were to be shipped by rail from some inland point to the coast.

The possible saving by shipment in a steel case has been estimated as a result of the shipment to Antwerp by the General Motors Exporting Co., noted above. In this particular instance the steel case measured 271 cu. ft., while a wood container for the same car would have measured 318 cu. ft. With the rental of the steel case estimated at $15, freight on the shipment at 25c. per cu. ft. at $67.75, return freight on the case at $3.85 and railroad haulage from seaboard to factory at $7.50, the total cost of shipment would be $94.10. In this calculation marine insurance has been assumed to be the same in either case.

A wood case with an initial charge of $50 and a possible salvage value of $10 would require a freight charge of $79.50, making a total of $119.50. Based upon these estimates the saving would be $25.40 in shipment charges alone, to which the $7.50 railroad freight charge for hauling the dismantled case to an inland factory might be added if the packing were done at the seaboard. In many countries where the c.i.f. cost is taken as the dutiable value an additional reduction of several dollars might result. It is thought that the duty on the container itself might nearly all be redeemed upon its return.

MACHINERY INTO INDIA

Industrial Equipment from United States Is Less Than 10 Per Cent of Total

Imports of industrial machinery into India during the fiscal year ended March 31, 1925, amounted to $39,149,147, and represented a decline of $11,047,497, or approximately 22 per cent below those of the preceding year, according to the official customs returns issued by the Department of Commercial Intelligence and Statistics, India. The participation of the United Kingdom in this trade amounted to $33,123,588 and accounted for 84.6 per cent of the total, as compared with a participation of 87 per cent during the preceding year.

Exports from the United States to India amounted to $3,605,975, or 9.2 per cent of the total industrial machinery trade, a slight increase from the 8.5 per cent share obtained during 1923-24. As recently as 1920-21 the United States furnished nearly 16 per cent of the total, and in 1919-20 about 26 per cent, the highest ratio ever recorded. The highest amount was in 1920-21.

For purposes of comparison over a five-year period figures are given in the table, listing by values the imports of industrial machinery into India during the years 1920-21 to 1924-25 inclusive. From this table it will be observed that the total of the 1924-25 imports amounted to slightly more than 50 per cent of the total value reached during the peak year 1921-22, and were but 78 per cent of the total accumulated during 1923-24 fiscal year.

Imports of Industrial Machinery Into India

Country of Origin	Fiscal Year 1920-21	1921-22	1922-23	1923-24	1924-25
United Kingdom	$59,446,451	$66,118,266	$49,923,997	$43,814,787	$33,123,588
United States	11,581,378	9,100,737	4,962,775	4,273,215	3,605,975
Germany and Austria-Hungary	572,045	1,262,241	1,928,235	1,034,814	1,217,260
Japan	456,754	90,334	58,093	107,476	85,798
All other countries	1,112,332	1,527,416	1,038,455	966,352	1,116,526
Total	$73,168,960	$78,098,994	$57,911,555	$50,196,644	$39,149,147
United States percentage	15.83	11.65	8.57	8.51	9.21

NEW UNIVERSAL TURRET LATHE

Covered Ways and 20-Hp. Alloy-Steel Head Are Features of 4½-in. Capacity Machine

A 4½-in. bar capacity No. 3-A universal hollow hexagon turret lathe incorporating many of the features of the 7½-in. capacity machine described in THE IRON AGE of June 3, page 1582, is being brought out by the Warner & Swasey Co., Cleveland.

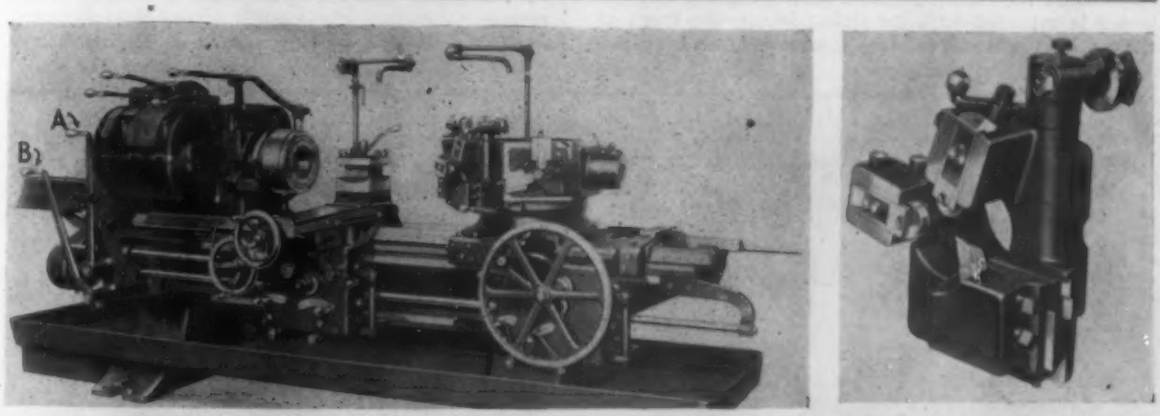
As in the larger capacity machine, maximum driving power, sturdy feed trains and rigidity for absorbing the increased power, are general features. Way covers which completely inclose the ways of the bed are features also, the ways of the machine being covered regardless of the simultaneous operation of the hexagon turret and the square turret in different positions along the bed. By thus preventing grit, chips and cutting lubricant from reaching the surface of the ways and also by eliminating marring from the dropping of tools, the initial accuracy of the machine is preserved for a longer period. Other features of the larger turret lathe incorporated in the machine illustrated include the rigid turret and turret binder for both hexagon and square turret, 16 feed changes and the improved carriage and saddle stops.

The bar capacity of the new model is 4½ in., which reduces the size of the all-geared head. Broad faced, hardened and heat-treated alloy-steel gears are used in the head and a 10, 15 or 20-hp. motor may be employed for the average range of light to heavy work. Twelve spindle speeds are available with one sliding clutch. Taper roller bearings with adjustment for end play are used for front and back shafts, with babbitted main bearings.

The 4½-in. capacity machine is provided with an automatic chuck, which is operated by lever *A*. Adjustment of the ring gives a variation of 1/16 in. under the standard size, where the stock varies. The master jaws take bushings and will not collapse to interfere with the introduction of a new bar of stock. A ratchet bar feed, operated by lever *B*, is furnished to handle the heavy stock. The automatic chuck may be removed with a spanner wrench when the machine is desired for chucking work, and a special 18-in. extra heavy three-jaw geared scroll chuck substituted.

The universal turner for the 4½-in. machine is of different construction from that for the larger lathe. The roller carriers are of generous proportions, adjustably mounted in the tool and hardened and ground. The cutter may be set to precede or follow the roll. A dial is provided with graduations for accurate sizing. The setting of the cutter is maintained by a thumb screw and is withdrawn by a quick-acting lever to avoid danger of marring the work. Overhead piloted tooling is provided as standard in the chucking equipment.

The maximum swing over the way covers is 25¼ in. and over the carriage 18 in. The length of the machine is 12 ft., the length including ratchet bar feed is 17 ft., and the width is 5 ft. 10½ in. The weight of the bare machine is approximately 9000 lb.



An Automatic Chuck, Operated by Lever "A," Is Provided for Bar Stock Up to 4½ In. By adjusting the ring, variation of 1/16 in. under size is obtained. The universal turner, shown at the right, is for high-speed, heavy reduction of bar stock

INDUSTRIAL MACHINERY

Exports During First Half of 1926 Almost 10 Per Cent Above 1925

United States exports of industrial machinery during the first half of 1926 amounted to $76,307,000, as compared with $69,538,000 for the corresponding period of 1925, thus representing a gain of almost 10 per cent, according to figures of the industrial machinery division, Department of Commerce.

This increase in exports was widely distributed throughout all of the main groups of industrial machinery, with the exception of metal-working and miscellaneous industrial equipment. Some of these items may have special significance. For example, the greatest gain was shown in mining, oil-well and pumping machinery, rising from $12,007,904 for the first six months of 1925 to $17,941,852 for the corresponding period of 1926, an increase of 50 per cent, suggesting activity in the mineral and petroleum industries. Similarly, construction and conveying machinery exports rose from $5,641,533 in 1925 to $8,725,639 in 1926, or about 55 per cent, and seems to indicate world-wide expansion along engineering and industrial lines.

United States Exports of Industrial Machinery

Class of Machinery	First Six Months 1926	1925
Power-generating, except electric and automotive:		
Steam engines, except locomotives	$4,428,084	$4,707,708
Internal combustion engines	2,578,344	1,851,281
Water wheels and water turbines	152,345	73,101
Total	$7,158,773	$6,632,090
Construction and conveying	8,725,639	5,641,533
Mining, oil-well and pumping:		
Mining and quarrying	8,195,514	5,030,708
Oil-well	7,028,374	4,740,667
Pumping, power	2,717,964	2,236,529
Total	$17,941,852	$12,007,904
Metal-working	9,076,227	10,770,388
Textile, sewing and shoe:		
Textile	5,792,867	5,246,351
Sewing, industrial	1,563,609	1,730,780
Shoe, except sewing	650,360	756,117
Total	$8,037,836	$7,732,248
Other industrial machinery	25,366,611	26,753,783
Grand total	$76,306,938	$69,537,946

Adds No. 3 Size to Line of Milwaukee Milling Machines

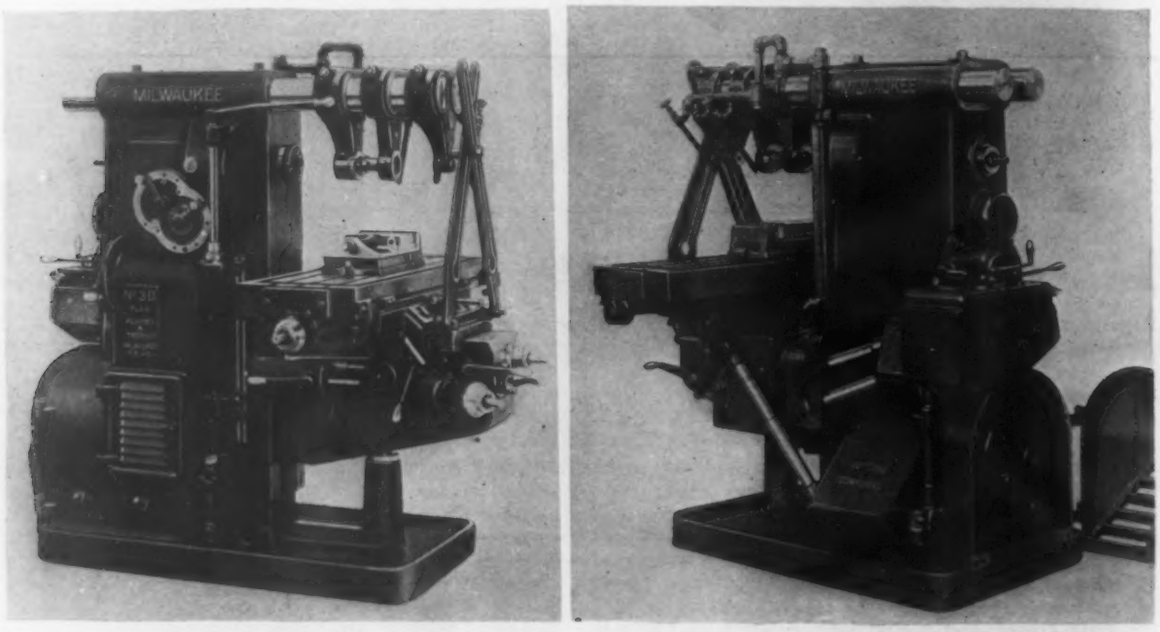
A No. 3 size milling machine, the design of which follows that of the company's new No. 4 milling machine described in THE IRON AGE of May 20, page 1431, is being added to the line of the Kearney & Trecker Corporation, Milwaukee.

The machine is available in plain, universal and vertical types. Although designed primarily for motor-in-base drive, belt drive can be furnished, and one type of drive may be substituted for the other at any future time. The same column is used in either case and the price is the same. The motor compartment is entirely inclosed in the base of the column and ventilation is provided by louvers in the door and side of the column, a fan being mounted also on the initial drive shafts. The drive from the motor is direct through gears and the motor is mounted with its pinion facing the front of the machine, where it receives automatic flooded lubrication. To assure quiet operation, the three initial gears in the drive train have ground teeth. The main drive shaft, idler shaft, friction clutch shaft, upper idler shaft and speed change shafts are mounted in Timken roller bearings.

An outstanding feature is the power rapid traverse that is provided not only for the table, but for the saddle and knee, all movements being controlled conveniently from the front of the machine. Multiple-disk friction clutch is incorporated for both the main drive and the power rapid traverse control. Another feature is a new self-oiling universal joint, details of which were given in the description of the No. 4 machine. In this design of joint the oil flows down inside the joint fork, through the connecting pin and into the groove on the inside of the steel ring. It is stated that centrifugal force keeps the connecting pins lubricated automatically at all times.

Lubrication is centralized. Automatic flooded lubrication is provided for gears and bearings in the column and feed box, and splash lubrication for rapidly moving parts in the knee. Wick oiling is employed for the table and saddle bearings. Two pumps are employed, one for lubrication inside the column and the other for cutter coolant. Either pump can be removed quickly by breaking a single pipe joint as described in the previous article. Coolant is delivered at the rate of 8 gal. per min. to the cutters, through a 1-in. pipe, under low pressure, which facilitates taking of heavy cuts. Six oil pockets are provided in the table for returning the coolant to the reservoir. The table is a semi-steel casting, 19 in. wide and 76 in. long. It is not cored out, but is left solid and the entire bottom finished.

Other features include duplicate control levers, front and rear, high and low feed attachment providing 36 feeds, from 3/16 to 40 in. per min.; and a safety slip clutch for protecting the feed mechanism in case of meeting with positive obstruction. Double overarm support to the arbor, table lock for boring operations, protected flanged spindle nose and spindle reverse are also features of this design.



Use of Roller Bearings; Power Rapid Traverse in Three Directions; and Centralized Lubrication Are Among the Features. The arrangement of the motor drive is shown in right-hand illustration

Improvements Incorporated in Rockwell Hardness Testers

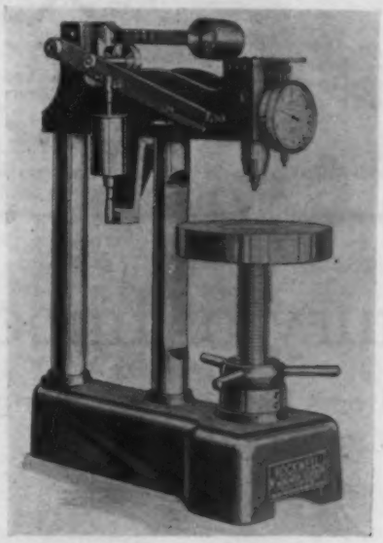
Refinements intended to facilitate testing have been incorporated in two new models of the Rockwell hardness tester, which have been placed on the market recently by the Wilson-Maeulen Co., Inc., 383 Concord Avenue, New York. The new machines, designated as the models F and G, respectively, replace the models A and B, previously offered. The readings of the new machines in terms of hardness are identical with the readings of the previous models, and the same penetrators may be used interchangeably on the new and old machines.

It will be noted from the illustration that the large G-shaped frame casting has been replaced by smaller castings. This change was made because of the warpage of the larger castings, both before and after machining. The castings employed in the new models are given light cuts and then allowed to age, and after further machining there is no appreciable further warpage. This is stressed as of importance because of the desirability of having the penetrator come down directly central over any spherical or cylindrical piece being tested.

Another feature of the new design is the arrangement of the bushing in which the elevating screw operates, this bushing being now made of hardened tool steel and made adjustable. Formerly the elevating screw operated directly in the cast iron base. This provision against wear is perhaps of special value where the machines are employed in making large numbers of tests each day. The moving parts in the head of the new machines are more thoroughly pro-

tected from dust, and the new models may be dismantled more conveniently for cleaning.

The noses of the new machines are shaped to permit better vision of the piece being tested, and the nose is cleared away so that it can get down into recesses better than formerly. The new machines are equipped with lever for tripping the major load, this



Improvements Include Features Intended to Assure Continuous Accuracy and Easier Operation on Production Work and Elimination of G-Shaped Frame

lever being located close to the direct-reading gage. Thus the operator, after setting the dial to zero by turning the bezel of the gage, has only to move his hand an inch or two to release the major load, which is the next step. The releasing of the major load and the lifting of the major load, which are also consecutive motions, are now accomplished by means of the same handle. The new design permits making taller machines at lower cost than formerly, because longer and larger columns and elevating screws can be employed with the standard head and base castings.

The 2G machine is for testing pieces up to 2 in. thick, and the 3F machine, for pieces up to 8 in. thick. The smaller machine tests from the edge of the piece inward to 3 in. and the 3F, inward to 5½ in. An 8 in. diameter iron testing table, shown in the illustration, is available for the F models. The machines weigh 60 lb. and 90 lb. respectively.

Paint Spray of Simple Design

Compactness and simplicity of construction are claimed for the paint spray here illustrated, which is for use in painting automobiles, tanks, structural steel work, machine parts and woodwork; for varnishing;

Light Weight and Absence of Moving Parts and Passages Which Might Clog Are Advantages Claimed

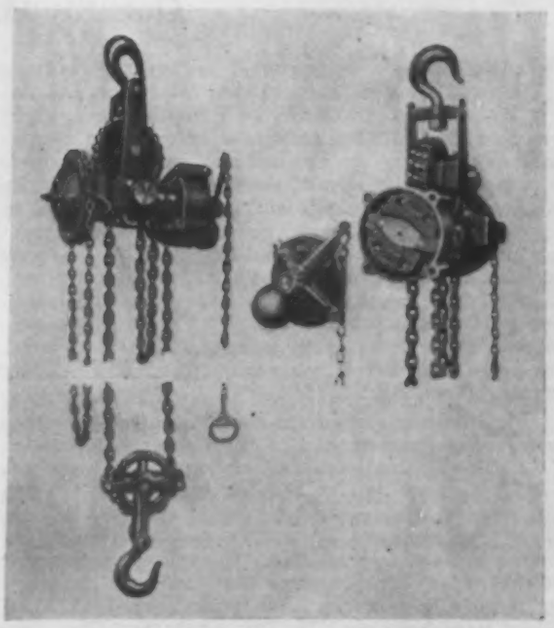
for coating cement floors and walls, and applying coatings to other surfaces.

The device is being marketed by the Alexander Milburn Co., Baltimore. It consists of a body, cover, atomizer and handle, and a feature stressed is the absence of moving parts and passages that are likely to clog. The device is light in weight and operation is simple. The paint enters a large annular chamber surrounding the air nozzle, from which it is atomized and expanded in a venturi-shape. The atomization is regulated by a turn of the nozzle, from a small to a large spray, or is entirely shut off, bringing into play a stream of air for dusting purposes. Pressure of 40 lb. is recommended, but the pressure may be varied to suit the work. It is stated that carbonic gas tanks may be employed also with good results. The thorough atomization of the paint is stressed as resulting in complete and even coverage of greater surface and with minimum consumption of paint.

Gravity-Lowering Chain Block

Saving of time in the raising and lowering of loads is claimed for the gravity-lowering chain block here shown, which has been placed on the market by Herbert Morris, Inc., Buffalo. The lowering of the load is automatic and is controlled by a centrifugal governor. Smooth operation is a feature, the 5-ton block being said to gravity lower with only 14 lb. on the hook.

The mechanism is simple. All working parts of the chain block are inclosed, and operate in oil and grease. The worm has a double thread. It is turned down from a solid steel shaft, and is heat treated, hardened and ground. End thrust of the worm shaft is taken on ball

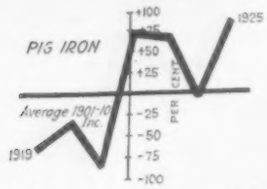


The Centrifugal Brake Keeps the Lowering Speed Within Safe Limits When Lowering by Gravity. An automatic stop prevents overlowering

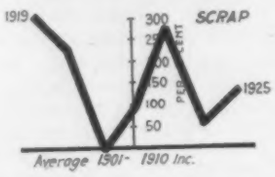
bearings. The worm wheel and the load-chain wheel are of one piece, eliminating the use of keys. The teeth of the worm wheel are machine cut from the solid.

The automatic brake is on the worm shaft and serves to hold the load whenever the hand chain is released. When lowering by gravity, the lowering speed is kept within safe limits, and overlowering is prevented by an automatic stop which applies the brake as the hook reaches its lowest position. Hoisting is accomplished by pulling the hand chain. In lowering by gravity, the gravity-lowering handle is pulled down, which actuates the centrifugal brakes and causes smooth and rapid lowering of the load until the handle is released. The hand chain does not move when lowering by gravity. The load may be lowered also in the usual manner by pulling on the hand chain, permitting closely controlled movement of the load, when desired.

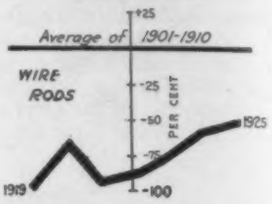
The chain blocks are available for working loads ranging from ½ to 5 gross tons. The lowering speed of the ½-ton and 5-ton hoists is 60 and 12 ft. per min., respectively. The weight of hoists of these ratings is approximately 94 and 435 lb., respectively.



Foreign Pig Iron, (Including Ferroalloys), Coming into the United States Since the War, Has Averaged 4.4 Per Cent Above the Annual Imports (285,150 tons) of the First Decade of the Century. Fluctuations have ranged from 85 per cent under in 1921 to 83 per cent over in 1925



In Only One of the Last Seven Years Has Incoming Scrap Been Less Than the Earlier Imports of 43,600 Tons Per Annum, and That Was 5 Per Cent Under (1921). The average for the period was over 150 per cent above that of the 1901-1910 decade



Wire Rods Were Received in the First Ten Years of the Century at the Rate of 17,000 Tons Per Anum. In no year since the war has the amount been as much as one-half of this, and in 1919 it was nearly 98 per cent less, or 342 tons

A Quarter Century of Imports

Marked Changes in Many Items Between Beginning and End of Period—Total Incoming Quantity 11,378,215 Tons

DURING the first quarter of the twentieth century such items of iron and steel imports as the Department of Commerce reported by weight amounted to 11,378,215 gross tons, according to a statement prepared by the iron and steel division. While it is not possible, because of classification inconsistencies of the Bureau of Foreign and Domestic Commerce, to segregate the rolled and finished steel entirely from the pig iron, scrap and semi-finished material, such division as can be made shows a total of rolled and finished steel amounting to 2,567,515 tons, with 8,810,700 tons in the other category. The principal item located in the wrong group consists of steel bars, which for years were listed in a general catch-all, including ingots, billets, etc.

Pig iron and ferroalloys considered together (they were not segregated prior to 1914) accounted for more than half the total incoming tonnage. This item was 5,841,892 gross tons, or 51.3 per cent of all. During the years in which complete segregation was had between pig iron and ferroalloys the imports of the former amounted to 1,661,187 tons and of the latter to 668,342 tons. If we assume that the same ratio held for the earlier years, pig iron imports over the 25-year period have been about 4,170,000 tons and ferroalloys 1,670,000 tons.

Imports of pig iron and ferroalloys have gone by fits and starts, varying from a maximum of 956,198 tons in 1903 to as little as 34,711 tons in 1918 and 44,036 tons in 1921, only to average 437,760 tons in the four subsequent years. In 1916, 1917 and 1918 our imports of ferromanganese and alloys far exceeded the pig iron imports, each of those years showing twice as much of the former as of pig iron. For the three years the totals were: Pig iron, 61,350 tons; ferromanganese and alloys, 163,477 tons. In no earlier or subsequent year of which we have record have ferroalloy imports exceeded pig iron.

Other Variable Elements

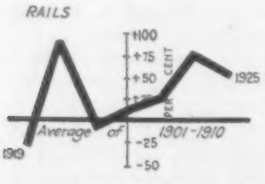
Scrap, like pig iron, has been up and down, with a total of 1,766,629 tons. The minimum year of the quarter century, 1909, with 5182 tons was followed by 118,610 tons the next year—a figure exceeded only five times in the 25 years. The maximum of 180,034 tons, in 1917, was followed by 63,730 tons in 1918 and by 177,293 tons in 1919. Considering scrap in a group with the pig iron component as raw materials, the incoming 7,608,521 tons was 66.9 per cent of the aggregate for all iron and steel items.

The total for the hybrid aggregation of steel ingots, blooms, billets and bars was 1,152,842 tons, of which nearly one-third—379,476 tons—came in in 1903, the year of highest iron and steel imports which we have known since 1887. In three years, 1902, 1903 and 1904, our incoming movement in this group was 561,856 tons, or 48.8 per cent of the entire quarter century's imports of such materials.

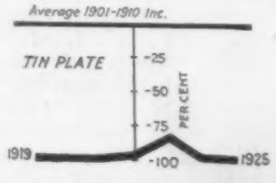
Wire rods—a semi-finished material, though, from the mill standpoint, comparable with bars—were imported in much larger quantities in the earlier years of the century than since 1913. The average yearly amount for 1901 to 1913 inclusive was 16,634 tons; for 1914 to 1925 inclusive, only 4367 tons. For the 25 years the total was 286,636 tons or only 9.4 per cent of the American production of 1925 alone.

Changes in Finished Material

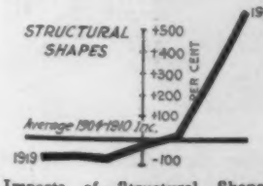
Plates and sheets have been segregated from each other for only a few years, and skelp—a semi-finished material—has been included in their total. Hoops and bands, over a large part of our survey, were not reported on the tonnage basis. Hence, comparisons are



Steel Rail Imports Since the War Have Exceeded by 34 Per Cent, on the yearly average, the Imports of the First Decade of the Twentieth Century, When They Were 23,435 Tons Per Annum



Against 62,000 Tons of Imports of Tin Plate Per Year for 1901-1910, Inclusive, the Imports Since the War Have Averaged 2175 Tons Per Year. In four of these late years imports fell off over 99 per cent



Imports of Structural Shapes in 1919, 1920 and 1921 Were One-Tenth of the 11,450 Tons of the Earlier Years, or Close to a 90 Per Cent Drop, But in 1924 They Exceeded the 11,450 Tons 2¾ Times and in 1925 5¾ Times

not easy in this group. As it stands, however, the range has been from a minimum of 1100 tons in 1919 to a maximum of 15,309 tons in 1925.

Tin plate production in the United States began about 1891. For some years the imports were greater than the amounts made here, but since 1897 the American production has gone ahead of imports and today the latter are almost negligible. Consequently, it is not surprising to find tin plate imports in the first ten years of our quarter century much higher than those in more recent years.

Structural shapes were not reported separately prior to 1904, in which year the imports were 14,310 tons, or about the same as the average of all the years since then. Only in 1924 and 1925, however, have structural shapes come in in large quantities.

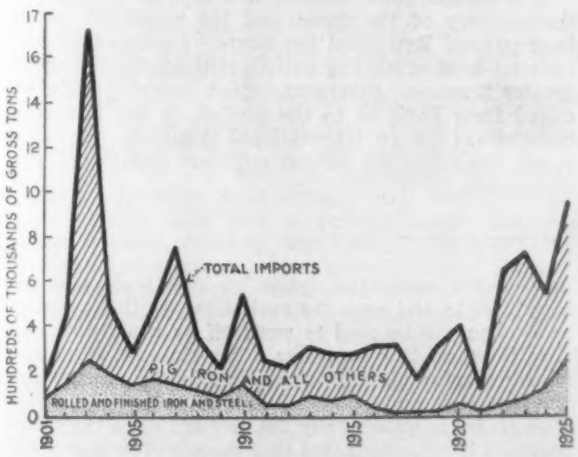
Iron bars came in in larger amounts prior to the World War than subsequently. In only two years before 1914 was the tonnage below 20,000; in only one year since 1914 has it reached 8500. With a total of 454,957 tons, the average for the first 13 years was 29,178 tons; for the most recent 12 years, 6304 tons.

In recent years various classifications of wire, pipe, castings, etc., have been established. In only 1924 and 1925 was cast iron pipe reported separately, it having been 46,900 tons and 50,939 tons respectively. These two items accounted for half of the total miscellaneous (omitted in the table) due to the fact that over the greater period of time the figures for many of these miscellaneous items were not reported in tons.

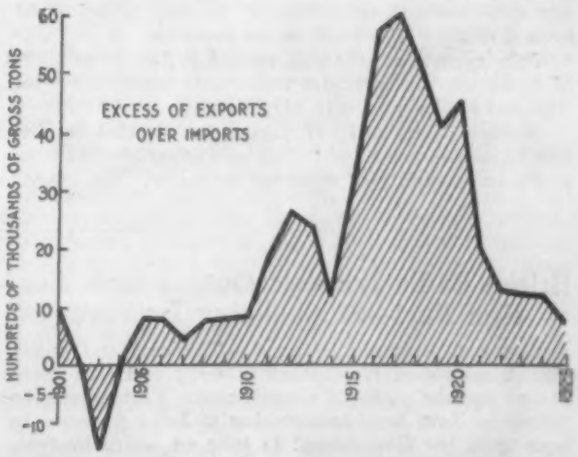
Rolled and Finished Tonnage

More rolled and finished steel was imported in 1925 than in any other year of the quarter century. The amount, however, did not reach the large totals of the years from 1880 to 1895 inclusive. Approximately one-tenth of the 25-year total of rolled and finished steel (2,568,000 tons) arrived in 1925 and almost as much in the big import year, 1903. Between these two dates imports have shown a varied course, reaching—naturally—a minimum in 1917, 1918 and 1919 of about 22,000 tons per year.

These figures, of course, are subject to the limitations already explained and based upon the peculiar method of reporting imports devised in the Department of Commerce. They show, however, that on the average between 20 and 25 per cent of the total imports consist of rolled and finished material. It may here be stated, however, that this total of imports for the entire 25 years is less than the exports of rolled and finished material during the two most recent years.



Rolled and Finished Iron and Steel Accounted for Less Than One-Quarter of All the Imports in the Past Quarter Century, or 22.6 Per Cent. Since the war the proportion has been less than 17 per cent. The peak of 1903 was due in part to a heavy domestic steel demand coming at a time when strikes checked coal production and led to railroad dislocation and uncertain steel deliveries



Imports of Iron and Steel in the Last 25 Years Exceeded Exports Only in 1903. The amount of the excess was 1,410,000 gross tons. In 1902 exports were 42,000 tons greater than imports and in 1904, 179,000 tons. The excess per year for the period up to the war, 1901-1914 inclusive, was about 911,000 tons; for the war years of 1915-1918, inclusive, 5,082,000 tons per year, and for the seven years since, 2,192,000 tons

United States Imports of Iron and Steel Products in Gross Tons

	Pig Iron and Ferroalloys	Scrap	Ingots, Blooms and Bars	Wire Rods	Plates, Sheets, Hoops, Etc.	Tin Plate	Structural Shapes	Rails	Iron Bars	Total	Per Cent Rolled and Finished
1901	39,325	20,414	8,859	18,566	2,527	52,625	.....	1,091	17,744	161,386	57.4
1902	158,961	49,188	90,427	17,181	13,256	88,828	.....	15,017	21,924	454,992	34.3
1903	956,198	136,451	379,476	22,990	9,571	49,068	.....	122,444	43,168	1,719,548	14.4
1904	191,135	28,614	91,953	18,519	12,028	86,856	14,310	53,358	30,767	497,579	37.3
1905	122,977	12,650	9,800	15,282	4,026	71,905	2,157	17,025	26,669	283,667	48.7
1906	271,790	25,810	19,644	18,495	14,494	53,937	25,598	9,635	37,917	487,562	34.9
1907	564,846	21,439	18,520	17,907	7,798	62,629	9,326	4,610	28,600	746,676	19.0
1908	204,092	17,614	16,499	13,571	3,096	62,830	1,530	2,839	32,504	364,576	32.8
1909	104,655	5,182	12,627	11,358	4,249	52,372	5,475	1,292	14,869	212,079	42.3
1910	237,594	118,610	37,227	15,718	6,352	69,003	10,659	7,030	34,073	536,765	26.7
1911	148,459	17,272	29,205	15,483	2,453	14,099	.....	.....	26,730	253,701	23.3
1912	129,325	23,612	18,702	15,069	3,299	2,053	3,116	3,780	26,112	225,068	23.7
1913	156,450	44,154	26,675	16,098	2,892	20,680	11,659	10,498	28,243	317,359	28.4
1914	136,720	34,849	40,189	6,954	4,310	15,411	10,145	22,571	15,015	286,164	26.0
1915	89,836	79,982	14,998	5,317	1,421	2,350	1,494	78,535	8,474	282,307	34.6
1916	135,249	116,039	26,142	4,130	1,730	1,008	1,473	26,299	7,701	319,871	13.2
1917	76,786	180,024	44,197	1,060	1,748	124	6,216	9,263	2,240	321,658	6.4
1918	34,711	43,730	41,076	7,677	1,517	32	3,504	8,705	1,469	142,421	14.1
1919	101,665	177,293	16,269	342	1,100	242	1,154	17,008	1,940	317,013	6.9
1920	185,944	140,645	24,232	5,488	1,792	400	1,685	45,684	4,987	410,857	14.6
1921	44,036	41,469	10,024	917	1,976	455	777	22,048	1,913	123,615	23.7
1922	492,595	82,854	27,720	1,726	1,947	2,682	7,823	26,629	8,093	654,606	7.3
1923	468,083	162,068	22,671	3,948	4,572	10,037	10,674	29,706	7,754	734,674	10.2
1924	268,911	66,341	39,024	6,851	6,064	1,036	42,245	43,358	4,325	556,621	23.7
1925	521,449	99,815	86,686	7,989	15,309	283	77,293	36,871	11,738	957,451	24.6
Total	5,841,892	1,766,639	1,152,842	268,636	130,027	691,855	260,313	615,196	454,957	11,378,215	22.6

British Mills Increase Production

Blast Furnaces Still Out—Belgians Reported Dissatisfied With Quotas in International Cartel—British Not Included

(*By Cable*)

LONDON, ENGLAND, Aug. 16.

PIG IRON is nominal, with No. 3 Cleveland foundry at £4 10s., No. 4 foundry at £4 9s., No. 1 at £4 12s. 6d. and No. 4 forge at £4 8s. 6d. per ton. East Coast hematite mixed is quoted at £4 1s. 6d. and Durham coke at £2 12s. 6d. per ton.

There is the usual holiday slackness of business, but stocks of iron and steel are at a very low level, especially supplies of semi-finished material. Most mills have booked numerous orders and with a large backlog are only awaiting settlement of the coal strike, when several months of activity seems assured.

July exports of pig iron totaled 32,164 gross tons, of which the United States took 16,618 tons. The total iron and steel export was 243,861 tons.

Walter Scott, Ltd., of Leeds, has decided to dismantle its Bessemer and rolling mill departments owing to the impossibility of economic operation. The output of the company was 1650 tons a week from four Bessemer converters.

Tin plate is quiet and prices irregular. Stock material is bringing 21s. 6d. to 24s. 6d. per base box. Plates made from foreign sheet bars and with foreign fuel are quoted at 22s. per base box, for September-October shipment. For shipment four to five weeks after settlement of the strike 20s. per base box is quoted, all f.o.b. works port. Galvanized sheets are dull but prices are firm as a result of the restricted output. Black sheets are still quiet.

Continental steel markets are firm as a result of the recovery of the franc and the possibility of an International Raw Steel Syndicate. Increased demand for semi-finished steel by British rolling mills is causing greater firmness. Divergent reports are still being received from Paris as to the success of the European negotiations for an international syndicate, the latest rumor being that the Belgian mills are dissatisfied with their quota.

British Mills Increase Output with Foreign Fuel—Shipbuilding Improves

LONDON, ENGLAND, Aug. 5.—The coal strike has almost completed its fourteenth week and still there are no definite signs of a settlement. Various outside influences have been endeavoring to bring pressure to bear upon the Government to take an active interest, but no action has been taken. Meanwhile a few thousand miners have returned to work under varying conditions in different districts, but there is certainly no evidence of a general desire to return to the pits. The harm done to the iron and steel industry has been incalculable, but latterly conditions have been improving slightly as a result of the increasing use of foreign fuel, both American and Continental, so that the output of finished steel and its manufactured products is expanding.

Production of pig iron, however, has practically ceased, as almost no blast furnaces are in commission, and it will be several weeks after the strike is settled before adequate supplies will be available. Most producers have substantial orders on their books, secured both prior to and since the coal strike, so that the first production will be used to work off as rapidly as possible these existing contracts. The chances, therefore, of any surplus pig iron appearing in the near future are somewhat remote, and although the price of Cleveland grades has risen fully 20s. per ton since the strike began, it is not anticipated that there will be any rapid decline in value.

A number of rolling mills have managed to keep operating and several have resumed recently, using foreign coal and semi-finished material. Increased activity is noted in Wales, where the number of tin plate and sheet mills operating has been increased recently, and the output of tin plate is 15 to 20 per cent of normal.

Colonial government orders for railroad material are still being placed, while shipbuilding shows signs of more activity, some builders evidently being able to compete successfully. Among the latest orders placed is one for two cargo steamers, each of 10,500 tons, which the Canadian Pacific has awarded to Sir

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British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.86 per £ as follows:

Durham coke, f.o.b..	£2	7½s.	to	£2	12½s.	$11.54	to	$12.76
Bilbao Rubio ore† ..	1	1	to	1	1¼	5.10	to	5.16
Cleveland No. 1 fdy.	4	12½	and	4	13*	22.48	and	22.60*
Cleveland No. 3 fdy.	4	10	and	4	10½*	21.87	and	22.00*
Cleveland No. 4 fdy.	4	9	and	4	9½*	21.63	and	21.75*
Cleveland No. 4 forge	4	8½	and	4	9*	21.50	and	21.63*
Cleveland basic (nom.)	3	15	and	3	15½*	18.23	and	18.35*
East Coast mixed...	4	1	and	4	2*	19.68	and	19.92*
East Coast hematite.	3	16	to	3	16½	18.46	to	18.58
Ferromanganese ...	14	0				68.04		
*Ferromanganese ..	14	5				69.25		
Rails, 60 lb. and up.	6	15	to	7	5	32.80	to	35.23
Billets	6	10	to	8	0	31.59	to	38.88
Sheet and tin plate bars, Welsh	6	5				30.37		
Tin plates, base box.	1	0	to	1	4½	4.86	to	5.95
Black sheets, Japanese specifications	13	10	to	14	0	65.60	to	68.04
						C. per Lb.		
Ship plates	7	5	to	7	15	1.57	to	1.68
Boiler plates	9	5	to	11	0	2.00	to	2.39
Tees	7	10	to	8	0	1.62	to	1.73
Channels	6	15	to	7	5	1.46	to	1.57
Beams	6	10	to	7	0	1.41	to	1.52
Round bars, ¾ to 3 in.	7	12½	to	8	2½	1.65	to	1.76
Steel hoops	10	10	and	11	0*	2.28	and	2.39*
Black sheets, 24 gage	11	0	to	11	5	2.39	to	2.44
Galv. sheets, 24 gage	16	10				3.58		
Cold rolled steel strip, 20 gage	18	0				3.91		

*Export price.
†Ex-ship, Tees, nominal.

Continental Prices, All F.O.B. Channel Ports

Foundry pig iron: (a)								
Belgium	£3	10s.				$17.01		
France	3	10				17.01		
Luxemburg	3	10				17.01		
Basic pig iron: (a)								
Belgium	3	3				15.31		
France	3	3				15.31		
Luxemburg	3	3				15.31		
Coke	0	18				4.37		
Billets:								
Belgium	4	13	to	£4	15s.	22.60	to	$23.08
France	4	13	to	4	15	22.60	to	23.08
Merchant bars:						C. per Lb.		
Belgium	5	0	to	5	2½	1.08	to	1.11
Luxemburg	5	0	to	5	2½	1.08	to	1.11
France	5	0	to	5	2½	1.08	to	1.11
Joists (beams):								
Belgium	5	0	to	5	2½	1.08	to	1.11
Luxemburg	5	0	to	5	2½	1.08	to	1.11
France	5	0	to	5	2½	1.08	to	1.11
Angles:								
Belgium	5	2	to	5	4	1.10	to	1.13
⅛-in. plates:								
Belgium	6	0	to	6	2½	1.30	to	1.33
Germany	6	0	to	6	2½	1.30	to	1.33
¼-in. ship plates:								
Belgium	5	10	to	5	15	1.19	to	1.22
Luxemburg	5	10	to	5	15	1.19	to	1.22
Sheets, heavy:								
Belgium	6	3	to	6	4	1.33	to	1.34
Germany	6	3	to	6	4	1.33	to	1.34

(a) Nominal.

W. G. Armstrong, Whitworth & Co. and to Barclay, Curle & Co. Both vessels are for delivery in August, 1927, completing the program of the Canadian Pacific for two passenger and five cargo steamers, all of which are being built in British yards.

Considerable excitement, followed by active buying, has characterized the Continental markets, it being thought fairly definite that the international steel cartel is more or less established, and only awaits ratification by the parties concerned. The British are not in it.

FRENCH MARKET BETTER

Export Situation Improves—Payment Terms Altered—Sheet Deliveries 2 to 4 Months

PARIS, FRANCE, July 29.—The market situation is better than last week. But it is clearly felt that the future demands price stability if we do not want the development of our metallurgic industry checked for many years.

Coke.—During the first 27 days of July the O. R. C. A. received from the Ruhr 205,850 tons of coke, or a daily average of 7630 tons.

Pig Iron.—Eight days ago, phosphoric pig iron producers fixed their new selling terms, which bring prices for August to 600 fr. per ton ex-works for No. 3 P. L.; the demand for pig iron has somewhat diminished. Foundry consumers have brought into their yards all the sows they could find, to provide against the continuous advance of prices. But 600 fr. is equal to seven or eight times the pre-war price. Besides, the new payment terms compel buyers to exercise prudence. Blast furnaces have known during the last few days an era of prosperity that their customers have shared, which explains that the price last fixed did not cause from the melters' side the protests which might have been feared.

Hematite pig iron producers had thought of raising prices again, as the difference between the basic prices of phosphoric and hematite pig irons was only in such case as high as usual. But the situation changed during the last week and at Wednesday's meeting hematite pig iron producers decided to keep during August their July selling conditions.

For export the price of No. 3 cast phosphoric pig iron has been fixed by the French-Belgian-Luxemburg agreement at 60s. per metric ton ($14.81 per gross ton) for sale in Belgium, or 600 fr.; for overseas countries, 77s. ($18.71) is normally paid, f.o.b. Antwerp, per ton of 1016 kg. (gross ton).

Finished Iron and Steel.—Business, after being next to nothing through last week, has been resumed, although on a very modest scale. Sellers are reserved; people are not yet satisfied on the franc's future and vaguely fear the new tax burdens. Inland prices cannot well be quoted; prices in sterling may serve. The export situation is better, although the Belgian franc's revalorization is a hindrance to business, which is in hand-to-mouth proportions. Merchant steels range from £4 12s. to £4 14s. ($22.35 to $22.85 per ton).

Sheets.—It is still possible to place a few orders for heavy sheets; in the North they have been sold at 950 to 1050 fr. per ton ex-works. Boiler plates are stationary at 1120 fr. For mediums the price is 1350 to 1400 fr. and in light weight, 1700 to 1800 fr. Delivery delays run from 2 to 4 months. In Lorraine, some plants invoice shipments at their export value on delivery day.

The export situation is rather satisfactory; basic 5 mm. (No. 6½ gage) sheets are still quoted at £5 ($24.30 per ton).

Foundry.—Activity is fair and buyers most pressing. In the Ardennes, smelters decided to raise the price of castings by 25 fr. per 100 kg., payment by draft at 30 days from the last day of shipping month, net and without discount. Malleable pig iron is no longer sold at a definite price, makers refusing to invoice otherwise than at delivery-day price, net payment at 30 days from date of shipment.

LUXEMBURG HARD HIT

Exchange Fluctuations Met By Sliding Scale Of Prices—Production Good

LUXEMBURG, July 30.—The difficulties of our metallurgical industry became worse during June, by reason both of the question of exchange and of the persisting mining strike in Great Britain. The strain of the Anglo-Saxon exchanges had its echo on the price of many raw materials and rendered necessary a new wage increase. The advance of the resulting cost has been partly compensated by the firmness of quotations, but the volume of business has been extremely restricted. Foreign export competition, especially German, remained active. Demand from British wholesalers remains considerable for various products and our works took advantage of it to secure some interesting tonnages to be specified in a short while. Far East and Latin American markets remain quiet.

At present the market situation is once more the prey of exchange rates. However, while the Belgians seem to have sufficiently refilled their order books, Luxemburgers appear more attentively watching for orders.

It is difficult to quote in francs, even for inland trade, in face of the constant and disorderly variations of the currency common to Belgium and Luxemburg. Some works make out their prices as follows: They assume a rate of sterling exchange comparatively low, with an increase proportioned to the difference between price on delivery day and the basic rate. Others quote at a fixed rate, with either advance or decrease corresponding to the rise or the diminishing of sterling value. But whatever the adopted system, it is the rate on the day of shipment which determines the final price of the goods sold. Lastly, to remedy the jerks that too sudden fluctuations might cause, the system takes as basis the quoted average for the pound sterling during three consecutive days: the day of shipment, the day before and the day following.

As an average, basic blooms are quoted: £4 6s. ($20.90); billets, £4 7s. ($21.15); largets, £4 12s. 6d. ($22.50), and steel bars, £4 13s. 6d. ($22.72, or 1.013c. per lb.).

Luxemburg pig iron production in June reached 211,251 tons; steel production was 190,354 tons. Out of 44 existing blast furnaces, 38 were in blast on June 30.

Belgian Iron and Steel Output in June

PARIS, FRANCE, July 30.—At the end of June 53 furnaces were in blast in Belgium, the same number as on May 31, as against 42 on Dec. 31, 1925, and 54 on Dec. 31, 1913.

Pig Iron.—Production was 294,750 tons in June, against 299,630 tons in May; 211,786 tons monthly average in 1925 and 207,058 tons monthly average in 1913.

Raw Steel Products (direct castings excluded), 290,730 tons in June, against 265,650 tons in May, and a monthly average of 195,321 tons in 1925 and 200,398 tons in 1913.

Direct Steel Castings.—6950 tons in June, against 6440 tons in May; 5562 tons monthly average for 1925, and 5154 tons average in 1913.

Finished Steel.—256,240 tons in June, against 240,590 tons in May; 164,942 tons average per month during 1925; and 154,922 tons during 1913.

Finished Iron.—16,050 tons in June, against 13,920 tons in May; 9761 tons average per month in 1925, and 25,362 tons in 1913.

Steel Imports Due to Increase Steadily

Need for Outlet for Materials for Which Home Markets Are Inadequate Results in Foreign Producers Sending Them Here

WASHINGTON, Aug. 16.—The high rate of imports of iron and steel into the United States is only natural and it is rather remarkable that the "invasion" has not come sooner, according to Marshall T. Jones, assistant chief, iron and steel division, Department of Commerce. In an analysis of the incoming shipments, Mr. Jones points out that the four leading producing countries of Europe—the United Kingdom, France, Belgium and Germany—all must find outlets for their surplus products, as their capacities are greater than their domestic consumption.

With a figure for June, 1926, of 124,215 gross tons, representing the largest monthly imports of iron and steel products into the United States since November, 1922, it was explained, there is a completed record total of 612,969 tons for the six months period, January-June, 1926.

Present Imports Far Below 1903

"Looking back over past performances, the total year's imports in 1924 were only 556,621 tons; in 1922 they were 654,606 tons, and in pre-war years averaged around 250,000 tons," said Mr. Jones. "In 1903 there were 1,719,548 tons imported, nearly a million of which was pig iron and about 400,000 tons of steel ingots. The monthly average for the year 1926 is 102,162 tons, whereas the average for the years 1921 to 1925 inclusive was only 50,450 tons, less than half the present rate, while for 1925 it was 79,788 tons. The average monthly figure for the years 1909 to 1913 inclusive amounted to only 25,748 tons, so that a marked tendency to increase can be noted."

Cast iron pipe has come into the limelight, Mr. Jones notes, as there is one foundry in France consistently selling pipe in the United States through an agent and it is stated that the cream of the business offered has been taken by this agent.

As indicating why this market has not been canvassed until rather recently, "this French pipe foundry sold a small lot of pig iron to an American firm in 1923, which, when it arrived, was not found satisfactory," said Mr. Jones. "An assistant director of the French firm finally came over to adjust the matter, and returned to France with enough orders to fill his company's pipe works for eight months, and thus the start was made."

Effect on Prices Out of Proportion to Tonnage

Mr. Jones pointed out that imports are relatively small when compared with domestic production, but that the fear of lower prices being quoted by the importer will naturally result in lower prices being submitted by domestic plants, until the point is reached where business for the latter is no longer profitable.

"Consignments of pig iron in the period January-June, 1926, were 52 per cent of the total, compared with 47 per cent in the same months last year. The proportion of rolling mill products, which includes steel bars, hoops, shapes, rails and splice bars, increased from 20.7 to 23.9 per cent of the total in the 1926 period, or from 101,708 to 146,432 tons, a 43 per cent jump in tonnage," it was stated. "It is in these items that Belgium and Germany are cornering the world's trade, much as the United Kingdom and the United States predominate in the tin plate and galvanized and black sheet markets. But the former group of products represent considerably larger tonnages, and as a rule are more easily sold."

Jumping from fourth place last year to first place this year, Germany shipped 128,809 tons during the January-June period this year, 21 per cent of the total, compared with 62,286 tons, 12.7 per cent, in the same months in 1925, or more than double.

An interesting phase of the import movement is the sharp decline in ferromanganese shipments. Imports from England decreased from 33,364 to 5524 tons, while from Germany they dropped from 1715 to 243 tons.

Imports of Principal Iron and Steel Products Into the United States from the Leading Countries of Origin

(In Gross Tons)

	First Half 1926		First Half 1925	
	Tons	Per Cent	Tons	Per Cent
Germany—				
Pig iron	89,647	69.6	51,091	82.0
Steel bars	6,251	4.9	2,130	3.4
Hoops	2,661	2.1	287	0.5
Ferromanganese	243	0.2	1,715	2.8
Shapes	8,369	6.5	1,115	1.8
Rails and splice bars	9,141	7.1	3,520	5.7
Nails and tacks	585	0.5	32	..
Barbed wire	548	0.4	454	0.7
Other products	11,364	8.7	1,942	3.1
	128,809	100.0	62,286	100.0
Belgium—				
Pig iron	5,648	5.3	7,006	6.7
Steel ingots	3,133	3.0	6,567	6.3
Steel bars	29,217	27.7	18,271	17.4
Hoops	4,126	3.9	4,310	4.1
Shapes	30,881	29.3	37,585	35.8
Rails and splice bars	16,994	16.1	18,481	17.6
Cast iron pipe	5,010	4.7	3,688	3.5
Nails and tacks	1,174	1.1	533	0.5
Barbed wire	1,089	1.0	1,727	1.6
Other products	8,137	7.9	6,799	6.5
	105,409	100.0	104,967	100.0
United Kingdom—				
Pig iron	80,071	82.3	34,618	46.0
Ferromanganese	5,524	5.7	33,364	44.2
Hoops	2,082	2.1	1,158	1.5
Tin plate	1,938	2.0	120	0.2
Plain wire	1,496	1.5	1,550	2.1
Steel bars	928	1.0	612	0.8
Wire rope	263	0.3	236	0.3
Shapes	385	0.4	1,017	1.3
Flat wire	466	0.5	347	0.5
Other products	4,155	4.2	2,404	3.1
	97,308	100.0	75,426	100.0
France—				
Scrap	.....	....	2,775	7.0
Pig iron	25,033	33.6	8,314	20.8
Steel ingots	12,280	16.5	6,674	16.7
Steel bars	7,842	10.5	1,829	4.6
Wire rods	.....	....	768	1.9
Hoops	1,166	1.6	99	0.2
Wrought tubes	957	1.3	3,040	7.6
Shapes	3,126	4.2	2,221	5.6
Cast iron pipe	22,059	29.6	12,221	30.6
Other products	2,065	2.7	1,928	5.0
	74,528	100.0	39,889	100.0
India—				
Pig iron	66,551	99.7	96,225	99.0
Ferromanganese	157	0.3	94	0.1
Scrap	.....	....	921	0.9
	66,708	100.0	97,240	100.0
Netherlands—				
Pig iron	44,434	74.7	27,580	83.7
Steel bars	4,176	7.0	2,647	8.0
Hoops	704	1.2	116	0.4
Shapes	4,914	8.3	301	0.9
Rails and splice bars	3,117	5.2	1,278	3.9
Barbed wire	460	0.8	.....	....
Other products	1,651	2.8	1,039	3.1
	59,456	100.0	32,961	100.0
Canada—				
Pig iron	3,018	8.9	4,640	11.7
Ferromanganese	8,261	24.4	1,895	4.8
Ferrosilicon	5,267	15.6	2,542	6.4
Scrap	12,695	37.6	27,841	70.5
Rails and splice bars	1,531	4.5	1,079	2.7
Other products	3,042	9.0	1,547	3.9
	33,814	100.0	39,545	100.0
Sweden—				
Pig iron	1,112	7.8	572	3.9
Steel ingots	1,845	12.9	3,699	25.4
Steel bars	5,906	41.3	3,166	21.8
Iron bars	1,111	7.8	1,909	13.1
Wire rods	2,915	20.2	2,737	18.8
Flat wire	720	5.0	623	4.3
Other products	702	5.0	1,851	12.7
	14,311	100.0	14,557	100.0
Norway—				
Ferromanganese	8,664	97.3	3,718	96.6
Flat wire	83	0.9	.....	....
Other products	164	1.8	132	3.4
	8,911	100.0	3,850	100.0

Plans Maturing for Entertainment of European Foundrymen

Features of the New York entertainment for the European foundrymen who will arrive in the United States on Sept. 20 on their way to the annual convention of the American Foundrymen's Association in Detroit will be a reception and dinner of welcome at the Hotel Pennsylvania. The reception will take place Monday, Sept. 20, shortly after the arrival of the steamships Lancastria and Deutschland, on which the guests will come, and the dinner is set for Tuesday evening, Sept. 21. A reception room will be set aside at the Hotel Pennsylvania as headquarters for the party while in New York.

Up to July 15, when the latest advices were received from London, 59 men and 10 women had registered for the trip. It is expected that 75 to 100 will come.

V. E. Minich, American Foundry Equipment Co., 366 Madison Avenue, New York, is chairman of the New York district committee. Other local chairmen are as follows: Stanley G. Flagg, Jr., of Stanley G. Flagg & Co., Philadelphia district; S. B. Cuthbert, Carnegie Steel Co., Braddock, Pa., Pittsburgh district; W. G. Krentz, Buffalo Foundry Machine Co., Buffalo district; Franklin G. Smith, Osborn Mfg. Co., Cleveland district; Charles Piez, Link-Belt Co., Chicago, Chicago district. H. Cole Estep, Penton Building, Cleveland, is chairman of the committee on international relations of the American Foundrymen's Association and is coordinating the work of the various committees.

Southern Hardware Jobbers Enjoined by United States Court

WASHINGTON, Aug. 17.—The Southern Hardware Jobbers Association, 132 corporations, seven firms and 31 individuals were enjoined from alleged violations of the anti-trust laws by a decree entered in the Federal Court at Richmond, Va., on Friday, Aug. 13. The Government charged that there existed a price fixing arrangement in hardware and agricultural implements. A statement issued by Attorney General Sargent says that the injunction brings to a successful conclusion the Government's case. It adds that "the decree is very broad in its scope and it is believed that the specific acts of the defendants which it prohibits will insure hereafter free and open competition among them, thus giving the people in that section who purchase hardware, agricultural implements and kindred articles the benefit of competitive prices."

Steel Institute's Program for Stockholm Meeting

The autumn meeting of the Iron and Steel Institute will be held, by kind invitation of the board of directors of Jernkontoret, at Stockholm, Sweden. The sessions will take place at the palace of the nobility (Riddarhuset), on Friday and Saturday, Aug. 27 and 28. The following is the list of papers which it is expected will be submitted:

"The Effect of Nitrogen on Chromium and Some Iron-Chromium Alloys," (Alloys of Iron Research, Part IV) by F. Adcock.

"A Physical Investigation into the Cause of Temper Brittleness," by J. H. Andrew and H. A. Dickie.

"Anomalies in Heat Conduction, with Some Determinations of Thermal Conductivity in Iron and Carbon Steels," by C. Benedicks, H. Bäckström and P. Sederholm.

"Electrochemical Potentials of Carbon and Chromium Steels," by C. Benedicks and R. Sundberg.

"The Treatment of Steel with Ferro-Carbon-Titanium," by G. F. Comstock.

"The Mechanical Properties of Four Heat-Treated Spring Steels," by G. A. Hankins, D. Hanson and Miss G. W. Ford.

"Is the Direct Change from Austenite to Troostite Possible?" by K. Honda.

"The Carburization and Decarburization of Iron and Some Investigations on the Surface Decarburization of Steel," by A. Johansson and R. Von Seth.

"The Development of the Swedish Iron and Steel Industry During the Last 30 Years," by A. Johansson and A. Wahlberg.

"Notes on Jernkontoret," by E. Kinander.

"The Testing of Hardened Steel," by A. Lundgren.

"Notes on the Development of the Swedish Mining Industry During the Last 25 Years," by W. Petersson.

"The Constitution of the Iron Silicon Alloys," by G. Phragmen.

Mechanical Engineers to Discuss Machine Shop Practice at Chicago

The Machine Shop Practice Division of the American Society of Mechanical Engineers will hold a session during the annual convention of the American Society for Steel Treating and the National Steel and Machine Tool Exposition to be held on Municipal Pier, Chicago, the week of Sept. 20.

Due to the large exhibit of machine tools and the many members of the A. S. M. E. in attendance, a forum will be offered on this subject. The meeting will be held at the Drake Hotel on either Thursday or Friday, Sept. 23 or 24. The program for that meeting is as follows:

"Drop Forging Hammer Anvils," by Eugene C. Clark, Chambersburg Engineering Co., Chambersburg, Pa.

"The Possibilities of Standardizing Design Details in Plants Manufacturing Special Machinery," by H. K. Keevir, McDonald Machine Co., Chicago.

"Inspection Methods," by E. D. Hall, manufacturing department, Western Electric Co., Hawthorne Plant, Chicago.

"Foremanship Training," by Hugo Diemer, LaSalle Extension Institute, Chicago.

COMING MEETINGS

September

American Ceramic Society. Aug. 30 to Sept. 2, inclusive. Summer meeting. Bellevue-Stratford Hotel, Philadelphia. Ross C. Purdy, Lord Hall, Ohio State University, Columbus, general secretary.

Institute of Metals. Sept. 1 to 4. Autumn meeting, Liège, Belgium. G. Shaw Scott, 36 Victoria Street, London, secretary.

New Haven Machine Tool Exhibition. Sept. 7 to 10. Sixth annual meeting, Mason Laboratory, Yale University, New Haven, Conn. H. R. Westcott, 400 Temple Street, New Haven, chairman exhibition committee.

Lake Superior Mining Institute. Sept. 8 and 9. Twenty-fifth annual meeting Ironwood, Mich. A. J. Yungbluth, Ishpeming, Mich., secretary.

Concrete Reinforcing Steel Institute. Sept. 13 to 15. Semi-annual meeting, French Lick Springs Hotel, French Lick, Ind. M. A. Beeman, 2112 Tribune Tower, Chicago, secretary.

Ohio State Foundrymen's Association. Sept. 16 and 17. Annual meeting, Hotel Sinton, Cincinnati.

American Society for Steel Treating. Sept. 20 to 24, inclusive. Eighth annual convention and national steel and machine tool exposition. Drake Hotel, Chicago. W. H. Eisenman, 4600 Prospect Avenue, Cleveland, secretary.

Society of Automotive Engineers. Sept. 21 to 23. Annual production meeting, Hotel Sherman, Chicago. John Warner, 29 West Thirty-ninth Street, New York, manager meeting arrangements.

American Foundrymen's Association. Sept. 27 to Oct. 1. Thirtieth annual convention and second international foundrymen's congress, Book-Cadillac Hotel, Detroit. C. E. Hoyt, 140 South Dearborn Street, Chicago, secretary-treasurer.

MANUFACTURED EXPORTS GAIN

Increase 60 Per Cent as Compared With Fiscal Year 1921-1922

WASHINGTON, Aug. 17.—Progress made by American manufacturers in building up and maintaining export markets and the importance of foreign sales of factory products as a stabilizer in export trade, as well as in the domestic industry, were pointed out by Dr. Julius Klein, director of the Bureau of Foreign and Domestic Commerce, in a statement made public yesterday. He called attention to the fiscal year just closed as a striking illustration of the rapid growth of American exports of manufactured goods which, he said, increased 16 per cent when compared with the preceding fiscal year, and 60 per cent when compared with the fiscal year 1921-1922. They were nearly three times as great in value as during the five-year period before the war. Commenting, Dr. Klein said:

This tremendous growth reflects the ever-rising efficiency of American industry and the energy and intelligence of American salesmanship in foreign markets. The American manufacturer has evidently disposed of sundry tattered scarecrows which used to startle his timid predecessors as they ventured along the strange paths of export. He no longer turns back at vague warnings regarding "slipshod American packing," "inadequate credits," "inexperienced export technique," or "inferior foreign trade financing." These threadbare bugaboos have been most effectively dispelled by the uninterrupted expansion of the overseas markets for our manufactures. Regardless of depreciated European currencies and low wages—in fact, partly because of the low standards of living which they imply—the intelligence and resourceful adaptability of the American manufacturer, backed by a firm policy as to quality in goods and services as against cut prices, have made a place overseas for American fabricated wares which bids fair to continue its steady growth.

Competition Encountered in Small Percentage of Products

Although granting that there will be rivalry between American and European manufactures, which is already evident in some lines of iron and steel products and in textiles, Dr. Klein declared that the actual competitive items represent a relatively small percentage of the total number of fabricated products exported. He predicted that American exports of manufactured products will gradually become a larger and larger share of the total exports, as a natural result of the growing population and the increasing industrial development of the country.

American inventive ingenuity, well paid and highly skilled American labor and mass production, sustained by a vast domestic market, it was stated, make the United States peculiarly efficient in the production of all classes of manufactured goods, save those in which hand labor predominates, with little or no dependence upon efficiency in mechanical equipment or executive organization.

It is to be expected and desired, Dr. Klein asserted, that exports of finished manufactures should steadily increase in relative importance, because "we must pay for the constantly greater quantity of raw material and luxury imports and for such growing 'invisible' debit items as tourist expenditures, immigrant remittances, shipping and insurance service, etc., and we should pay for them with those goods which we can produce most efficiently."

A table was submitted by Dr. Klein showing gains in exports of manufactured products since 1921-1922. Particular mention was made of increased exports of automobiles, cash registers, machinery of all classes, and iron and steel. Dr. Klein said the old predominance in exports of a few factory centers in the Middle Atlantic and Northeast States is no longer in evidence. He declared that a steadily increasing percentage of many export items is coming from other sections—steel and textiles from the South; wood manufactures from the Northwest, Gulf States and around the Lakes; and leather goods, agricultural implements and many specialties, from the Middle West.

European Recovery Indirectly Benefits American Exporters

Warning American manufacturers that export trade is dependent upon perseverance and alertness, Dr. Klein said:

The rapidity of this progress in our manufactured exports should certainly not stimulate any smug complacency on our part. Success in foreign trade has always been contingent upon resourceful vigilance, and with the continued economic uncertainties of Europe and in view of their far-flung reactions, this is emphatically the time for alert watchfulness on the part of our merchants and manufacturers.

Nor can it be said that we are simply filling the vacancy left by the continued absence of European wares from certain overseas markets. Our leading European rivals are making rapid strides in the recovery of their overseas trade and an analysis of these figures for 1925-26 will show that there is comparatively little in our progress which is likely to impede their own.

Ours is very largely a trade in products which are either based upon our predominance in necessary raw material supplies or in the production of certain specialties of types and grades distinctly different from those which could be shipped abroad in any quantity even by a restored Europe.

Far from menacing the future of our manufactured exports, there is absolutely no question but that the recovery of Europe implies several vital economic elements in favor of our trade in fabricated wares. A careful analysis of the experience of our exports of these lines during the last six years in certain selected markets in the Far East and Latin America brings out clearly the fact that the expansion of these particular outlets varies directly with the growth of the European demand for raw materials produced in those countries.

Revised Master Specifications

WASHINGTON, Aug. 16.—The Federal Specifications Board has just issued revised master specifications, to become mandatory for all Government departments on Nov. 8, although they can be put into effect earlier, for: Seamless brass pipe, iron pipe sizes, extra strong; fire clay refractories; seamless brass tubing.

Copies of these specifications may be obtained upon application to the Federal Specifications Board, Washington. In connection with the seamless tubing chemical compositions are given for three grades, while standard weights and dimensions are shown in a table and tolerances in another table. Similar data are given for the seamless brass pipe of iron pipe sizes.

Steel Plants Had 26 Days' Coal Supply On July 1

WASHINGTON, Aug. 14.—Stocks of bituminous coal at steel plants on July 1 were sufficient for 26 days' supply, based on the rate of consumption at the time of stock taking, according to a statement issued by the United States Bureau of Mines. This compares with 25 days' supply on May 1. Supplies at by-product coke plants on July 1 were sufficient for 23 days, as against 20 days on May 1.

On July 1 stocks of bituminous coal in the hands of consumers amounted to approximately 39,000,000 net tons. On April 1 the stocks were 40,000,000 tons. Production during April was less than consumption and about 4,000,000 tons were withdrawn from stocks. In May and June the condition was reversed; production exceeded consumption and 3,000,000 tons were added to stocks.

Duties on Manufactured Goods Raised in Proposed Cuban Tariff

WASHINGTON, Aug. 17.—The report of the Cuban Tariff Commission is understood to provide increases in duties on a large range of merchandise, especially manufactured articles, and reductions on certain raw materials employed in Cuban industry, according to a cable received by the Department of Commerce from Frederick Todd, commercial attaché, Havana. It is also reported that the commission has recommended that a system for the official valuation of merchandise subject to ad valorem duties be embodied in the decree by which the new tariff is to be put into effect.

The Norton Co., Worcester, Mass., has developed a process for securing greater uniformity in the grains of its Alundum and Crystolon abrasives. This is emphasized as securing added uniformity and strength. The grain is obtained from crushing the abrasive and screening, and it appears that formerly it was difficult to eliminate a certain percentage of weak grains.

FRANCE MAKES RECORD

June Ingot Output Highest Ever Attained—Exports Below 1925 Figures

WASHINGTON, Aug. 16.—Inquiries and orders to French iron and steel mills during July were heavy because of the British situation and the further fall of the franc, according to a cable received by the Department of Commerce from Commercial Attaché Jones. During June 778,000 metric tons of pig iron and 694,000 tons of steel ingots and castings were produced, the ingot output establishing a record. Figures for the first six months of 1926 were 4,570,000 and 4,061,000 tons respectively, as compared with 4,091,000 and 3,567,000 tons respectively, for the corresponding period of 1925.

On July 1 there were 153 blast furnaces in operation, also a record, with 27 ready for blowing in and 37 under construction or repair. In the event the present rate of production is maintained through the remainder of 1926, the total will exceed the combined output of France and Lorraine in 1913.

French Exports Lower Than Last Year

Imports of pig iron into France for the first half year of 1926 amounted to 13,000 metric tons, compared with 16,000 tons for the January-June period in 1925, and imports of general iron and steel products rose to 83,000 tons in 1926, as against 74,000 tons last year. Exports of pig iron increased 2000 tons over 1925 in the first half year, totaling 334,000 tons. Of general iron and steel products, exports fell from 1,557,000 tons in 1925 to 1,479,000 tons this year.

Net exports this year are slightly lower than in either half of last year and are not maintaining the high level reached toward the end of last year. The steel market is generally rather in an upset condition, with heavy buying both on domestic and foreign account. Some items sold have taken the productive capacity up to the end of the year, but shipments from the mills of some other products are about keeping pace with current sales. Orders for future delivery are being accepted only at prices ruling at the time delivery is made, with special discounts allowed if a deposit is made when the order is placed. Early repercussion of the present feverish activity is expected in France if the recovery of the franc is maintained.

More Barytes Sold in 1925

WASHINGTON, Aug. 16.—Domestic producers of barytes made sales amounting to 228,063 net tons, valued at $1,703,097, in 1925. This was a gain of 16 per cent in quantity and 10.5 per cent in value, as compared with 1924, according to reports received by the Bureau of Mines. The average selling value, f.o.b. mine, dropped from $7.85 to $7.47 a ton. Missouri was the largest producer, shipping 44 per cent of the total output, while Georgia ranked second and Tennessee third.

Foreign Demand for American Tractors Increases

WASHINGTON, Aug. 17.—Exports of tractors from the United States have shown rapid and consistent increases during the past five years until at present they constitute about one-third of the total exports of agricultural implements, according to the Agricultural Implements Division.

Total tractor exports in 1920 amounted to approximately $30,000,000, but the exact figure cannot be stated, as tractors were not at that time classified separately in the export statistics but were included under traction engines. Farm tractors were classified separately beginning April 1, 1921, and exports for the last nine months of that year were 2380 tractors, valued at $2,247,001. The following year, however, shipments of tractors were more than double those in 1921, amounting to $5,959,019.

During the first six months of 1926, foreign shipments of wheel tractors amounted to 32,109, valued at $17,511,000. This was more than $7,000,000 greater than the exports in the same period of 1925, and was greater than the tractor exports in any calendar year except 1925 since 1920.

Immigration Shows Increase

WASHINGTON, Aug. 17.—Aliens admitted to the United States during the fiscal year 1926 totaled 496,106, as against 458,435 during the fiscal year 1925, and 879,302 during the fiscal year 1924, according to Harry E. Hull, commissioner general of the bureau of immigration, Department of Labor. The total number of alien arrivals during the fiscal year 1926 was 516,656, but after examination 20,550 were found to be unacceptable and were therefore debarred.

Of the aliens admitted during the year ended June 30, last, 157,432, or 95 per cent of the annual quota of 164,667, came in as immigrants charged to the quota. This compares with 145,971, or 89 per cent of the annual quota, admitted during the fiscal year 1925. Emigrant aliens departing during the fiscal year 1926 totaled 76,992, while the number of non-emigrant aliens leaving the country during the year was 150,763, making a total of 227,755 departures, or 268,351 more admissions than departures.

The greatest number of aliens admitted during the fiscal year from any single country was from Germany, with a total of 58,675, while England ranked second, with 44,206; Mexico third, with 42,638; and Ireland fourth, with 42,475. The admissions included 56,827 skilled workers, of which 1469 were classed as iron and steel workers, 2038 as machinists, and 432 as metal workers.

American Sheets, Galvanized in Japan, Sold to Chinese Merchants

WASHINGTON, Aug. 14.—Shipment of a large quantity of plain and corrugated galvanized sheets from Japan to the Yangstze River ports has aroused considerable interest, because the sheets were bought as black steel sheets in the United States, shipped to Japan, where they were galvanized, and put on the market in China at a figure roughly 15 per cent under the market there for the galvanized product. 'The success or failure of the first shipments will mean a great deal to importers to whom galvanized sheets are an extremely important item, according to a report received by the Department of Commerce from Consul General Edwin S. Cunningham, Shanghai.

Labor costs in Japan are said to be responsible for the ability to undercut American market prices and, in the event of the material proving to have a durability equal to that of sheets galvanized in the United States, the report says it is not difficult to predict the immediate reaction of the trade.

Schedule of the next installments of the Business Analysis and Forecast, by Dr. Lewis H. Haney, Director New York University Bureau of Business Research, follows: Aug. 26—General Business Outlook; Sept. 16—Activity in Steel Consuming Industries; Sept. 23—Position of Iron and Steel Producers.

BOOK REVIEWS

Die Anwendbarkeit der geophysikalischen Lagerstaettenuntersuchungsverfahren, insbesondere der elektrischen und magnetischen Methoden. By Rodolf Krahmann, Dr. Ing. Pages 40, 6⅝ x 9⅝ in., illustrations, 37. Published by Wilhelm Knapp, Halle, Germany.

This thesis on geophysics treats in very thorough manner the discovery of subterranean deposits of ore, coal, petroleum, salt, etc., by magneto-electric processes, replacing in great extent, but not entirely, the present usual methods by boring. They are not intended to supersede these latter, but to make them more certain, hence avoid unnecessary boring. Up to the present the literature on this subject has been meager and widely scattered; and there has been but little collaboration and exchange of opinions and results.

The geologist seeks deposits mainly by observation of surface indications; the geophysicist, on the other hand, penetrates the bowels of the earth without physically disturbing any of the tested areas. For direct results he considers gravitation and its local differences, magnetic lines in horizontal and vertical direction and in intensity, natural electric earth currents, radio-activity, and the temperature of the earth at various depths; for indirect results, the resistance or conductivity of local areas with respect to artificial electric currents, current penetration or reflectivity in the same local areas, and conductivity or reflectivity to artificial seismic shocks.

One set of interesting experiments that have led to valuable practical results consists in sinking two vertical electrodes with good earth connections, at a given distance apart, and measuring, by a special apparatus, the direction and force of the induced electric stream lines passing through the earth mass when a current is passed between the electrodes. By their curves these stream lines give the position of the deposits, say of copper or of petroleum, as indicated by an induction ring, adjustable vertically and horizontally. By reason of their greater conductivity, anthracite deposits are more readily indicated than bituminous. Testing an area of one square kilometer four times takes about one to two weeks. At one end of the scale of magnetic susceptibility stands quartz; at the other, magnetite, about 100,000 times as great.

Lack of space prevents going more into detail concerning the various instruments—torsion balances, etc.—used in geophysic experiments and treated in this pamphlet. The bibliographical references are quite liberal.

Gemeinfassiche Darstellung des Eisenhuettenwesens. Herausgegeben vom Verein Deutscher Eisenhüttenleute. 12th edition, 1923. Pages 661, 6 x 9 in.; illustrations 119. Published by Verlag Stahleisen m.b.H., Düsseldorf, Germany.

This valuable work bristles with statistics, tabular and other, as its compilers intended it to do. Commencing with a general chapter on the winning and working of iron, especially so-called technical iron, it takes up the properties of this metal, its fracture, malleability and other physical qualities, and after branching off into historical matters, the book proper considers iron ores and their working, coke making, blast-furnace operation (with a special section treating of electric ore furnaces) and their products. Part II takes up the description of wrought iron, with hearth and puddling furnaces, then the Bessemer and Thomas converters, followed by the Siemens-Martin processes. Next in order comes the production of cement, refined and crucible steels, followed by consideration of electric wrought iron and steel production.

Part III is devoted to the methods of giving form to the products previously mentioned: iron and steel casting, including chilling, forging, hot and cold rolling, and pressing wrought iron. A not unimportant section is given to the protection of surfaces against corrosion, by galvanizing and inoxidation. Part IV takes up the questions of power and transportation, testing, etc., other than production proper, and is followed by an article on the education of metallurgical engineers.

From this on the book treats of the importance of the iron industries; showing their condition in 33 different countries.

Then come excerpts from the history of the chemical progress of the German iron industries describing the introduction of the various processes, one after the other. The commercial side of the business in relation to ore, scrap and iron has a special section; then railways and canals in various countries are dsicussed; and what is very important, there is a detailed consideration of the innumerable "concerns," trusts, cartels, verbands, etc., for which German industry is noted.

Chapter X of this part of the book treats of the workers in the various iron industries; insurance, wages, laws, and the like.

Chapter XI is devoted to the varying tariffs from 1879 to the date of compilation of the book.

A very full Appendix gives a list of all the blast furnaces and foundries in Germany, arranged both alphabetically and geographically.

Altogether, the work is what we might expect from its compilers, accurate, interesting and valuable as a reference. R. G.

Handbuch der Eisen- und Stahlgiesserei. Edited by C. Geiger, Dr. Ing., aided by numerous collaborators. Second and enlarged edition of Vol. I. Pages 661, 7⅝ x 11⅝ in.; illustrations, 278; plates, 11. Published by Julius Springer, Berlin, Germany.

Typographically, this work is up to the high Springer standard, although the great length of the printed line, in comparison with the type size, makes difficult reading, despite the use of Roman letter, and the excellent paper and presswork. The fact that the twenty very valuable chapters have been prepared by sixteen different specialists makes for thorough treatment of each topic, but lessens the continuity, causes some duplications, and sometimes misleads.

The first chapter, by Dr. Geiger, considers the terms "iron" and "steel" as such; and is practically entirely devoted to the nomenclature. It quotes Ledebuhr's and Wedding's classifications, also those considered as standard in German industry; while incidentally mentioning the introduction of "semi-steel" from the United States. Chapter II, by the late Professor Beck, with an appendix by Geiger, takes up the history of iron and steel founding from pre-historic times, with some interesting illustrated examples of fifteenth and sixteenth century castings, with incidental mention of the occasional addition of tin and bismuth to the molten iron. We are reminded that the hot blast was first used in 1829 for cupolas, and that steel castings first appeared in 1851 (for bells.)

There are chapters on metallurgy and metallography, covering the influence of copper upon iron, among other things; on ferrosilicon, spiegeleisen and the like, and on the scrap question, including scrap briquetting.

Another chapter discusses cast iron. Table 79 classifies cast iron according to the German nomenclature, and gives percentages of various chemical components for various purposes, such as locomotive cylinders, piston rings, etc., not neglecting special tables for American, British, French and Swedish usage.

"*Flusstahl*," meaning a malleable metal somewhat richer in carbon than malleable iron, is compared with Bessemer, Siemens-Martin, electric and crucible steels.

The testing of cast iron, the theory of cupola functioning, fuels, measurement of temperatures in the foundry, the fire-resisting materials employed in cupola, furnace, etc., molding sand, core sand, etc., and in fluxes all come in for treatment in as many chapters.

The extraordinarily rich and full references to authorities are right in place at the foot of the pages to which they belong. Especial attention is paid to the misuse of German technical terms, a matter that concerns English-speakers when reading German works or considering business contracts where such terms are used. Tungsten and chromium iron alloys receive practically no mention, while nothing is said of the rust-preventing properties imparted by manganese and chromium. O. T.

Foundry Cost Accounting, Practice and Procedure. By Robert E. Belt, C. P. A. Second edition, revised and enlarged. Pages 267, 6 x 9 in. Penton Publishing Co., Cleveland.

The author, who is in a position to know the weakness of the foundry industry, is correct in saying that not one-third of our job foundries know where they make money, if they are making it, nor where they lose if they are losing. Some years ago the writer called attention to the fact that R. G. Dun & Co. classed foundries first in the number of failures and average amount of money lost; and he gave the reason—which Dun & Co. did not—improper cost systems, particularly in that foundry cost accountants simply could not be induced to keep time on piece-work jobs.

Mr. Belt considers cupola labor as both direct and indirect, whereas ten of the principal cost accountants in this country have agreed with the writer's contention that each day's melt is one job, delivering material to the molding floor, and hence that practically all cupola labor is direct.

In figuring costs, he does not consider the question of casting size as distinguished from casting weight. Pouring a hub in a 4-ft. tractor wheel rim with inset spokes costs a great deal more for labor than pouring the same weight of isolated metal; furthermore, it limits the molding floor output. The production-order tag is defective in that it does not state whether or not there are cores, and if so how many; but it does give the molding price, which is unnecessary, as no business of the molder.

There is no formula to calculate the amount to be set aside regularly for replacement of equipment.

The author is correct in considering that all costs of labor, supplies, etc., should be recorded departmentally. Unfortunately, too few foundry cost clerks agree with him, at least in practice. Distribution of tumbling and sand-blasting costs on the tonnage basis is highly incorrect, as some pieces take more tumbling but less sand blasting, some more of both, than others. There is nothing about how to charge stock cores, nor to figure the cost of annealing. To your reviewer, the book is somewhat disappointing, as he expected more, in view of the author's reputation. R. G.

Ocean Shipping. By Robert Edwards Annin. Pages 427; five illustrations. Published by the Century Co., New York, as part of its foreign trade series. Price, $3.

This work treats of the fundamental principles of practical steamship operation, at least that part thereof pertaining to the management and operation of cargo ships, as based upon experience, a subject that we all agree, especially after the lessons of the war, is highly important; yet one which will probably never be taken up again seriously, unless or until we have another war. The failure of governmental operation is stated to be that there is "no one to cuss, no one to sue, and no one to reward." The requirements will be: better quarters, more comforts, better food, better treatment and better pay; but these imply higher freight rates.

Chapter VI, on the "Black Horse Cavalry," makes amusing yet beneficial reading concerning brokers, especially in the South, who made fortunes by "shipping ventures" during the war; and who suggest Gilbert's bad baronet, whose hands were steeped in infamy, but whose heart was "as the heart of a little child." Chapter VII is devoted to terms and definitions; Chapters VIII and IX respectively to types and values, and the banking problems; while "Stowing the Cargo" follows.

In the second part of the book, space is devoted to the machinery of foreign trade, foreign exchange (which too few understand), the traffic manager, selection of cargo, loading and dispatching, revenue, and choosing the voyage. In Chapter XXVII we have good hints about keeping records.

Part III on the contract is very legal. A number of appendices and a fairly good, but not too good, index increase the value of the book, especially to the layman. G.

Blue Book of Southern Progress

Another volume of Southern data, that for 1926, has been issued by *Manufacturers Record*, Baltimore. Agriculture and industry, manufacturing, mining, building construction, railroads, banking and other economic factors are given in great detail in a book which reaches 370 pages, of which about 130 pages consist of advertising. The information covered is varied and it is handled both by products and by States. Comparisons are made between the Southern States and the other States, in a good many lines.

Bulletins Discuss Electric Steel Castings

An attractive and informative set of bulletins is being issued by the Lebanon Steel Foundry, Lebanon, Pa., which discuss various phases of the electric steel casting industry. They are well illustrated. Such subjects as the rise of the steel casting industry, the growing use and characteristics of electric furnace steel castings, molding sand and cores, technical control of the sand, pattern mounting and a description of the core and molding departments are among those treated.

The official report of the Thirteenth National Foreign Trade Convention, held at Charleston, S. C., on April 28, 29 and 30, has been issued by O. K. Davis, secretary, from the headquarters at India House, Hanover Square, New York. The volume is bound in cloth, and contains 490 pages, 6 x 9 in. It carries a verbatim transcript of the addresses and discussions of the convention, as well as a complete list of the delegates in attendance. The opening address on "The Foreign Trade Outlook," by James A. Farrell, president United States Steel Corporation, and another on "The South's Part in American Exports," by George Gordon Crawford, president Tennessee Coal, Iron & Railroad Co., both of particular interest to the steel industry, were published in full in THE IRON AGE, April 29 and May 6 respectively.

New Books Received

Mathematics for Engineers. By Raymond W. Dull. Pages 780, 5¾ x 8¼ in., illustrated. Published by McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York, N. Y. Price, $4.50.

The Story of Steel. By J. Bernard Walker. Pages 208, 5½ x 8¼ in., illustrated. Published by Harper & Brothers, 49 East Thirty-third Street, New York. Price, $4.

Wages in the United States. Pages 153, 6¼ x 9¼ in., illustrated. Published by National Industrial Conference Board, Inc., 247 Park Avenue, New York. Price, $2.50.

Die Kaolinlager in Schlesien. By Egon Pralle. Pages 52, 6½ x 9¾ in., illustrated. Published by Verlag von Wilhelm Knapp, Halle (Saale), Germany. Price, 3.60 marks.

Handbook of Domestic Oil Burning. Pages 234, 5 x 7¼ in., illustrated. Published by American Oil Burner Association, 350 Madison Avenue, New York. Price, $2.75.

Die Selbstkostenrechnung in der Eisengiesserei. By A. Lischka. Pages 82, 6¾ x 9¾ in., illustrated. Published by R. Oldenbourg, Glückstrasse 8, Munich, Germany. Price, 6.50 marks.

Business Analysis and Forecast

BY DR. LEWIS H. HANEY

DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

Current Statistical Data, Considered Independently of Trade Opinion, Indicate That:

STEEL production may make a new high peak, when trend and seasonal factors are considered.

Finished steel markets seem to be in a position to hold prices stable; demand is heavy and costs are high.

Steel ingot production is about 20 per cent above present estimated normal requirements.

Pig iron production is approximately 19 per cent above estimated normal requirements.

Lower prices for pig iron are not likely if production is curtailed a little further.

STABILITY has been the outstanding characteristic of the iron and steel price situation during the past month. Even black sheets have held steadily now for over two months. THE IRON AGE average for pig iron prices has not moved for a month. Furnace coke, too, has been relatively steady at around $2.85. This is logical enough, inasmuch as the price structure is in fairly normal adjustment, the most notable exceptions being the low level of sheet prices and the fact that scrap is a little high in comparison with pig iron and billets.

Upturn in scrap prices, however, generally means an advance in the pig iron market. Last year steel scrap moved up in June, followed by an upturn in pig iron in September. Looking at the price curves one would conclude that the present situation is similar and that an immediate advance in pig iron is therefore probable. Such reasoning, however, would be superficial, as the conditions of demand and supply differ considerably. Production of pig iron is now far greater than it was a year ago; and stocks have been accumulating recently, while inventories were being drawn upon at this time in 1925. Moreover, the general level of commodity prices was rising last year, but is moving downward now.

The Bradstreet index of commodity prices declined again in July, which is the eighth successive month of downward movement. While the decline has been gradual, it has been general and continuous. Usually pig iron follows the general trend of commodity prices rather faithfully and its gradual sagging course this year is no exception.

Steel Prices Hold in Face of Commodity Weakness

FINISHED steel, however, continues to hold up in price in spite of the declines in the general level of commodities and of pig iron. It has made little response this year to the decline in steel scrap (which is usually barometric). The best explanation of this situation appears to be that (1) the *demand for finished steel is stronger than either the demand for the average commodity or the demand for pig iron*, and (2) the price being already low in comparison with costs, steel makers are able to maintain a steady market. In spite of the decline in pig iron and scrap, the average of finished steel prices is not out of line with raw materials. Thus the demand side of the price equation is the immediately important factor. Cost of production is of course playing a part, but if it were not for the extraordinary demand for steel, prices would probably have declined some time ago. Steel prices have fallen below cost on more than one occasion.

In a sense, the July ingot output was higher than that for any month since August, 1923. That is, after allowing each month for the normal growth of the country's requirements and for the usual seasonal changes, July this year turns out to be the highest point yet reached in the upswing since the bottom in the middle of 1924. A glance at the first chart shows that the *trend* of steel production has been upward during the last two months.

It now seems probable that a new peak will be made this fall. Steel production is above normal and has been so for a long time, but *the same may be said of the activity of those industries which consume steel.* Steel prices are so low that consumption is encouraged, and now a general upward trend in buying is indicated by the increase in the unfilled orders of the Steel Corporation.

Unfilled Orders Make an Upward Turn

AT 3,603,000 tons, the unfilled orders of the Steel Corporation at the end of July were nearly 124,000 tons higher than in the preceding month and a little greater than a year ago. The backlog of the steel industry is still small, but this is not so significant as was the case when forward buying was more common. In spite of the low level of unfilled orders, the change in their *trend* is probably as significant as

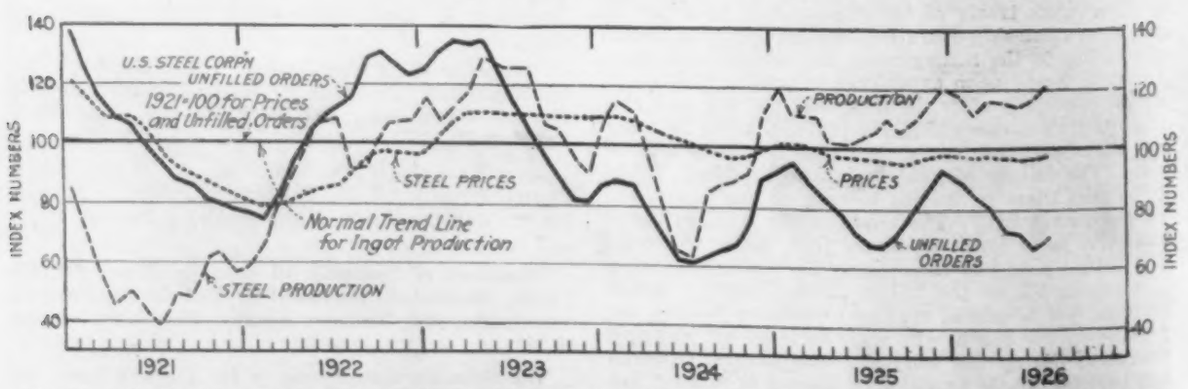

Fig. 1—July Steel Ingot Production, Allowing for Trend and Seasonal Changes, Was the Highest Since 1923. Prices continue to hold, in spite of a decline in general commodities. Unfilled orders may rise for some months, though the high rate of steel making may not persist

In This Issue

Pig iron and ferroalloys make up more than half our iron and steel imports in the last quarter century.—Definite figures not possible under changing classifications of Commerce Bureau, but rolled and finished steel tonnage accounts for 20 to 25 per cent of total imports.—Page 492.

Dr. Haney sees probability of new peak in steel production this fall.—Above-normal activity of steel-consuming industries likely to maintain high output, with low prices stimulating consumption. Increase in Steel Corporation's unfilled orders indicates upward trend in buying.—Page 502.

Equipment changes speed up production in motor plant.—Changes in method of machining motor flywheels save more than 43 min. per wheel without increasing number of men on job.—Page 473.

High yield point and high ductility are chief features of German "Freund" steel.—Although not a new development, steel made with 1 per cent silicon has lower carbon content than product alloyed with manganese, and is cheaper than nickel alloy.—Page 481.

Are present rates of production of both iron and steel too much in excess of normal requirements to be maintained?—Dr. Haney believes that lower prices for pig iron are unlikely if production is further curtailed, and that the finished steel market is likely to hold.—Page 502.

Output of heat treating furnace increased by motor-operated loading device.—Motor factory achieves higher efficiency by means of pusher bar, which delivers load to furnace and is returned by motor-driven crank levers.—Page 473.

Steel packing case for automobiles may accomplish reduction of exporting charges.—Decrease of cubic area and increased safety in shipment are principal advantages over wood cases now in use.—Page 487.

Strength of steel joist floor panel not impaired by intensive heating.—Laboratory fire test reveals slight permanent deflection in joists with retention of their transverse strength.—Page 485.

Iron and steel imports for first half of year set new record.—June is largest month in point of tonnage since November, 1922. Department of Commerce explains increase as natural tendency, with capacities of leading producing countries greater than their domestic consumption.—Page 496.

Ferrosilicon plant is largest consumer of electric power in Southern city.—Produces 7500 tons of 50 per cent ferrosilicon annually in three open-top electric furnaces.—Page 483.

Imports of rolled and finished steel in last 25 years are less than exports of same products in last two years.—Commerce Bureau's figures for quarter century show iron and steel products sent out of country in excess for every year except 1903.—Page 493.

United States and Great Britain not likely to be adversely affected by proposed European "steel trust."—Price fixing not aimed at, with the main object the protection of member countries against each other.—Page 506.

Water power as source of energy has more than doubled since 1913.—Use of oil and gas has also increased greatly, and remarkable gains in efficiency of utilization have been achieved in all sources of energy.—Page 507.

Railroad freight traffic for first half of year sets new record.—Volume of freight handled in June is 2 per cent higher than in any previous June with daily average movement of cars mounting to 30.1 miles.—Page 486.

Full section tests of metal tubing are not comparable with tests of round or flat specimens.—Results may be in error as much as 100 per cent on unsafe side, leading to acceptance of materials with low ductility.—Page 477.

Electric locomotive of unusual size is installed in Carnegie plant.—Eighty-ton unit will derive current from double third rail at 230 volts taken from the mill's power system, and is expected to transport 6000 tons of hot metal daily.—Page 509.

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It now seems probable that a new peak will be made this fall. Steel production is above normal and has been so for a long time, but *the same may be said of the activity of those industries which consume steel.* Steel prices are so low that consumption is encouraged, and now a general upward trend in buying is indicated by the increase in the unfilled orders of the Steel Corporation.

Unfilled Orders Make an Upward Turn

AT 3,603,000 tons, the unfilled orders of the Steel Corporation at the end of July were nearly 124,000 tons higher than in the preceding month and a little greater than a year ago. The backlog of the steel industry is still small, but this is not so significant as was the case when forward buying was more common. In spite of the low level of unfilled orders, the change in their *trend* is probably as significant as

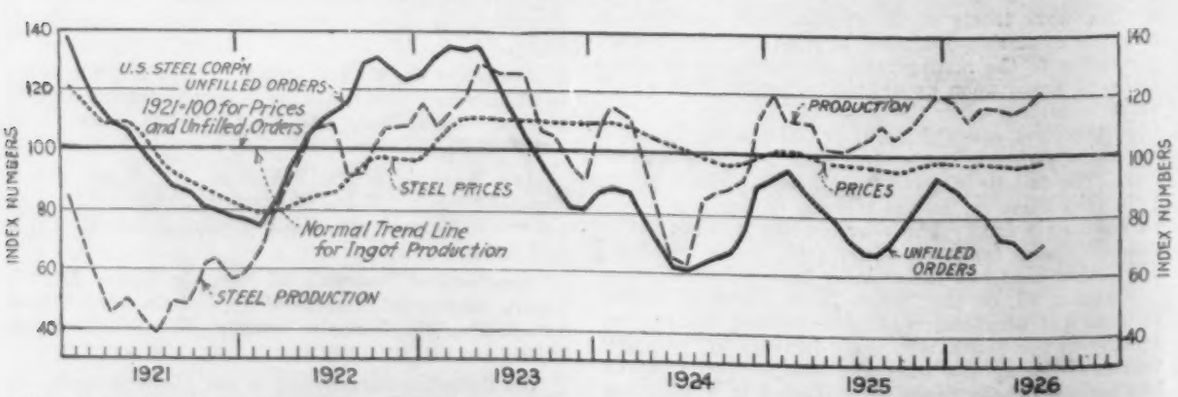

Fig. 1—July Steel Ingot Production, Allowing for Trend and Seasonal Changes, Was the Highest Since 1923. Prices continue to hold, in spite of a decline in general commodities. Unfilled orders may rise for some months, though the high rate of steel making may not persist

In This Issue

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High yield point and high ductility are chief features of German "Freund" steel.—Although not a new development, steel made with 1 per cent silicon has lower carbon content than product alloyed with manganese, and is cheaper than nickel alloy.—Page 481.

Are present rates of production of both iron and steel too much in excess of normal requirements to be maintained?—Dr. Haney believes that lower prices for pig iron are unlikely if production is further curtailed, and that the finished steel market is likely to hold.—Page 502.

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Steel packing case for automobiles may accomplish reduction of exporting charges.—Decrease of cubic area and increased safety in shipment are principal advantages over wood cases now in use.—Page 487.

Strength of steel joist floor panel not impaired by intensive heating.—Laboratory fire test reveals slight permanent deflection in joists with retention of their transverse strength.—Page 485.

Iron and steel imports for first half of year set new record.—June is largest month in point of tonnage since November, 1922. Department of Commerce explains increase as natural tendency, with capacities of leading producing countries greater than their domestic consumption.—Page 496.

Ferrosilicon plant is largest consumer of electric power in Southern city.—Produces 7500 tons of 50 per cent ferrosilicon annually in three open-top electric furnaces.—Page 483.

Imports of rolled and finished steel in last 25 years are less than exports of same products in last two years.—Commerce Bureau's figures for quarter century show iron and steel products sent out of country in excess for every year except 1903.—Page 493.

United States and Great Britain not likely to be adversely affected by proposed European "steel trust."—Price fixing not aimed at, with the main object the protection of member countries against each other.—Page 506.

Water power as source of energy has more than doubled since 1913.—Use of oil and gas has also increased greatly, and remarkable gains in efficiency of utilization have been achieved in all sources of energy.—Page 507.

Railroad freight traffic for first half of year sets new record.—Volume of freight handled in June is 2 per cent higher than in any previous June with daily average movement of cars mounting to 30.1 miles.—Page 486.

Full section tests of metal tubing are not comparable with tests of round or flat specimens.—Results may be in error as much as 100 per cent on unsafe side, leading to acceptance of materials with low ductility.—Page 477.

Electric locomotive of unusual size is installed in Carnegie plant.—Eighty-ton unit will derive current from double third rail at 230 volts taken from the mill's power system, and is expected to transport 6000 tons of hot metal daily.—Page 509.

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Feeling the Pulse of Trade

THE collection of market news has been an important branch of IRON AGE service for many years. Every week representatives of THE IRON AGE in the leading market centers carefully canvass current changes in the business situation as affecting iron and steel. Adequate market reporting consists of much more than a mere listing of transactions and prices. The work is not for budding reporters; it calls for mature judgment, familiarity with iron and steel products and their uses, an intimate knowledge of trade practices, and an ability to present an uncolored analysis of the current state of the markets.

Quite distinct from business forecasting, market reporting is not concerned with prophecies, but with present conditions and trends in specific commodities. To have real value market news must be fair both to buyer and seller and free from propaganda.

All these considerations THE IRON AGE has stressed in building up its market staff.

For News Summary See Reverse Side

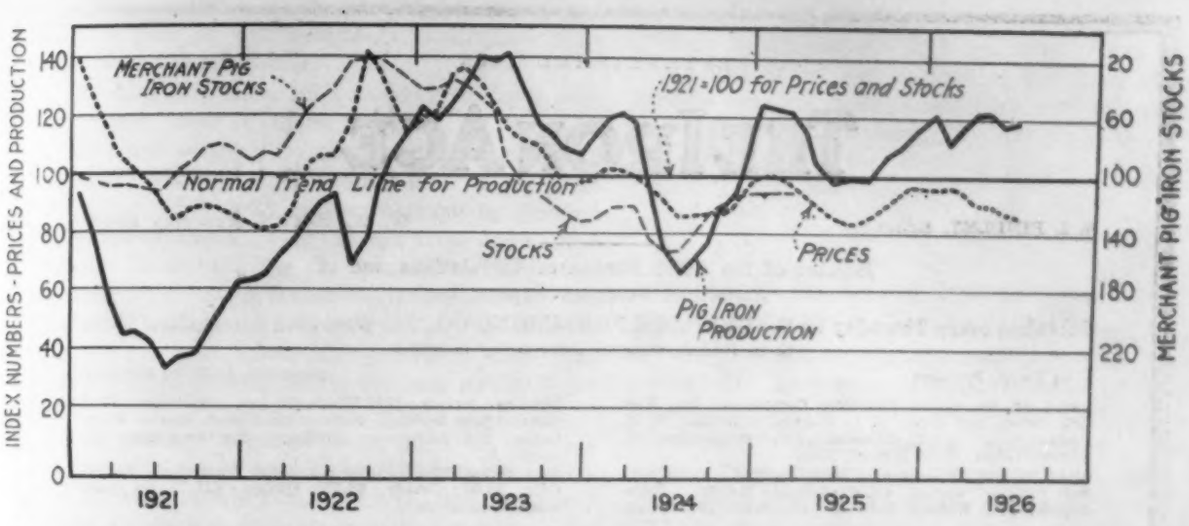

Fig. 2—Though Pig Iron Production in July Was Below That of June, the Drop Was Less Than Seasonal; Hence, the Index Rose. Production, however, was lower with relation to that of ingots than has been the case for some months

ever. The coming upturn was signalled by a diminution in the rate of decrease during recent months, and turns like this usually mean the beginning of an upward movement that lasts for several months. The situation is, in several respects, like it was a year ago, when, following a rise in our adjusted index of steel production, the unfilled orders began to decrease less rapidly and finally turned up in September.

There is this difference, however: A year ago production was not so large as it is now—not nearly so far above normal. In July, 1925, the adjusted index was 104; now it is 120. Unless all statistical evidence is to fail, steel production cannot be indefinitely sustained at a rate 20 per cent above the long-time trend, and the continued decline in new building contracts lends point to this observation.

According to THE IRON AGE composite, the July average price of finished steel was 2.431c., against 2.42c. in June and 2.435c. a year ago. If the buying of steel continues to hold up, as is probable, through the fall months, a steady price level is to be expected. With such a large volume of production and small volume of unfilled orders, it is not likely that an advance in the average price can be effected and maintained. But steel prices are low and should easily be held stable.

Pig Iron Output Relatively Below That of Steel

PRODUCTION of pig iron in July was a little under the June figure. It must be remembered, however, that a decrease of over 1½ per cent is usual between those months, and, accordingly, our adjusted index actually moved up a little, being 118.7 for July against 117.3 for June and 99.2 a year ago.

Iron production differs from steel in being lower than it has been in several months this year and much further below the 1923 peak. In fact, judging by our estimated normal, *steel production gained on the iron output in July and for the first time since last December it may be said that the quantity of iron produced is relatively low compared with the production of steel.* The ratio (of the average daily production of pig iron to the average daily production of steel ingots) declined in July.

This is a favorable development and one which usually occurs at times of expansion. The only question is, are not both these production items sufficiently in excess of normal requirements to indicate that, however well adjusted they may be, they are too large to be long maintained? It is clear enough, in our opinion, that pig iron output is still in excess of requirements, the signs being evident in the blowing out of furnaces, in the accumulation of stocks, and in the weakness of prices.

Pig iron averaged $19.52 in July, which compares with $19.82 in June and $18.96 in July, 1925. For several weeks THE IRON AGE index has held steady at $19.46. While greater firmness is probable in the pig iron market within a few weeks, no advance is probable in the near future, or until production is curtailed a little further and the ratio of iron production to steel production declines somewhat.

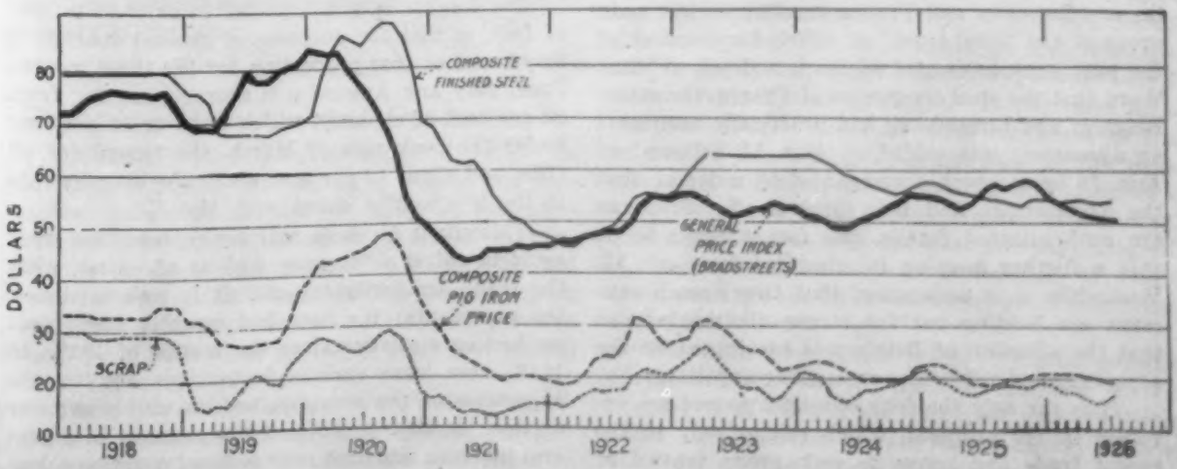

Fig. 3—As the General Trend of Commodity Prices Has Been Downward Since December, It Might Be Inferred That Steel Prices Are Accordingly Due for a Sharp Drop, but This Is Not Likely, Since Steel Demand Is Much Higher Than That for General Commodities

ESTABLISHED 1855

THE IRON AGE

A. I. FINDLEY, *Editor*

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Member of the Audit Bureau of Circulations and of Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

C. S. BAUR, *General Advertising Manager*

F. J. Frank, *President*

George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 239 West 39th Street, New York. A. C. Pearson, *Chairman*. F. J. Frank, *Pres.* C. A. Musselman, *Vice-Pres.* Fred C. Stevens, *Treas.* H. J. Redfield, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 425 Park Square Building. Philadelphia: 1402 Widener Building. Cleveland: 1362 Hanna Building. Detroit: 7338 Woodward Ave. Cincinnati: First National Bank Building. Buffalo: 833 Ellicott Square. Washington: 536 Investment Building. San Francisco: 320 Market St.

Subscription Price. United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50; Foreign, $12.00 per year. Single Copy 25 cents.

Entered as second-class matter, June 18, 1879, at the Post Office at New York, N. Y., under the Act of March 3, 1879.

PRINTED IN U. S. A.

The European Steel Agreement

INCREASE in the world's production of steel from 75,000,000 tons in 1913 to 89,000,000 tons in 1925 was said at the annual meeting of the (French) Comité des Forges to have been due entirely to the larger requirements of the United States. As a matter of fact, the gain of 14,000,000 tons for the world was precisely that made by the United States during that period. It was pointed out that distant countries—India, China, Japan and Australia—"are now producing about 1,500,000 tons, so that those markets are taking less iron and steel from Europe." Consequently, the five leading European steel producing countries are obliged to keep their production down to requirements among themselves and for non-producing countries, an amount—put for last year at 33,500,000 tons—far below their capacity to produce.

It was argued, in view of these circumstances, that the only way to save the situation is for producers to distribute the business on definite agreement. Realization of this fact is behind the movement for the formation of steel cartels which has figured so prominently in the market news from Europe in the past two years.

Altogether against the choice of both, the compulsion of their respective economic deficiencies has thrown Germany and France together as the main props of the "steel trust" of which Paris cables of the past week have said so much and yet so little. Word that the steel companies of France, Germany, Belgium and Luxemburg had practically completed an agreement was cabled on Aug. 14, followed on Aug. 16 by a report, accompanied by a denial, that the negotiations had been broken off. Scant as are authenticated details, the fact appears to be that a further meeting is scheduled for Sept. 17. Meanwhile it is understood that two French concerns are holding out for larger allotments, also that the adhesion of Belgium is contingent on the adjustment of differences among her negotiators.

Thus far only the four countries named are involved in the proposal, which relates only to the export trade and leaves to each group control of the trade in its own country. Price fixing is not aimed at, seeing that a schedule of export prices would be a target for producers in countries outside the entente. The machinery consists of the familiar method of apportioning tonnages and of paying into the pool penalties for over-shipment and of drawing out compensation for under-shipment.

While neither the United States nor Great Britain will be a party to the arrangement, neither is likely to be adversely affected by it, since the main purpose is to protect the four member countries against each other. The European rail pool recognizes the place both British and American makers have won in the international rail trade, and by the same token the four groups which seem likely to come to an understanding at the meeting set for Sept. 17 may be expected to refrain from any aggressive concert against British and American export trade in other products.

Why No Mid-Summer Dip?

THAT steel production last month and this has held up in an unusual way has caused no little comment. As to the facts in production, the 2.7 per cent decrease from June to July shown by the ingot production statistics is insignificant.

The August rate is expected to be close to that of July, so that for purposes of general analysis it may be taken that production for the three months June, July and August will average not far from 80 per cent of capacity, which is 13 or 14 per cent under the peak rate of March, the record for all time, and about 10 per cent under the average rate in the five months ended with May.

This slight decrease, scarcely representing what could be called a "summer dip" at all, is not what the trade ordinarily expects. It is well to review the precedents. We have had monthly steel ingot production statistics since the middle of 1917. In 1918 there were various fluctuations due to the exigencies of the occasion, and no visible summer decline. In 1919 production was engaged in a general increase, and that year does not count, nor does 1920, when there was difficulty due to a railroad strike. In 1921 there was such a sharp dip that

the influence of the post-boom liquidation must have been a large factor.

We have left, then, for possible precedents, only four years. One of them, 1922, is of doubtful significance, seeming to show a tendency toward increasing production, interfered with by the great coal strike, while 1923 counts itself out by showing decreased production every month after April, clear through December. We are reduced, in the matter of really trustworthy statistical information, to two years, 1924, when the July-August ingot production was 47 per cent under the preceding peak, and 1925 when the corresponding decrease was 22½ per cent.

The memory of older times, when the monthly pig iron reports of THE IRON AGE were an indication of steel production, is clear, that relatively lighter production in summer rather was the usual thing.

The key to the matter is that the slightness of the mid-summer dip this year is not out of keeping with conditions as to consumption, but is unusual because the conduct of buyers was different in previous years from their conduct this year. There was formerly the practice of buying ahead, under which the making of engagements would naturally be avoided in the summer. There was also the practice of carrying stocks, with a disposition to liquidate them in summer.

This year buyers were disposed until well along in May to expect lower prices; but in any event they were indisposed to carry stocks. They came up to the summer period without stocks and perforce had to call for larger shipments. While its effect cannot be gaged, the firmer attitude of leading steel companies on prices presumably contributed to the increase in specifications.

From another angle, there is the point that in the old days when mills were sold well ahead the disposition was to let the equipment run as it would, and humidity and heat interfered with production in summer. Now, with customers requiring precisely so much steel, blast furnaces and open-hearths are put on and off just as circumstances require. Thus while the course of summer production this year may be considered unusual or unprecedented, it does not signify a corresponding increase in the rate of steel consumption and it promises nothing especially remarkable for the later months of the year.

Exporting More Finished Goods

FINISHED manufactures exported from the United States have shown a steady and consistent gain year by year, in spite of occasional adverse developments in other groups of exports. During the fiscal year ended June 30 last, finished manufactures at 1937 millions represented a gain of 16 per cent over the amount for the previous fiscal year. The three preceding gains had ranged from 7.4 to 15.4 per cent.

There is a steady increase in the finished manufactures percentage of our total exports. Beginning with 32.7 per cent in the fiscal year ended in June, 1922, it reached 41.6 per cent in the year just ended. The average for the five years was 36.6 per cent. If we add semi-finished material, this average figure becomes 49.6 per cent. Thus virtually half of all our exports of the fiscal years 1922-26 were put through manufacturing processes, either partial or complete. The manufactures thus exported reached the impressive total of 10½ billions for the five years.

Leadership in Safety Instruction

PREVENTION of industrial accidents involves two-fold methods: mechanical safeguards and psychology. Education in the recognition of what constitute hazards, and why, and establishing coincidently a "safety complex" on the part of the worker, form the psychological element. Unfortunately these lessons often become lost since familiarity may breed indifference. Herein lies the need for continuous effort, on the part of those charged with promoting safety, in keeping the rank and file from growing lax in observance of the rules laid down for their guidance.

Authorities agree that installation of mechanical safeguards has reached such a point that not more than one-tenth of the industrial accident damage of 1925 might have been avoided by adding such equipment. Realizing this fact, New York University has announced a course in industrial and public safety which will train workers in these fields to apply more intensively the second preventive element—psychology. Thereby it is hoped to provide a means for lessening the fearful losses, which in the United States, from all accidents, amounted in 1925 to 84,000 deaths, 2,000,000 injuries and more than $1,000,000,000 in material damage.

Industry has given a remarkable account of itself in reducing accident frequency and severity, notably in iron and steel manufacture and in the metal trades. Organization and authority have been large factors in this result. The vastly greater task of making the world outside of industry safe for the individual means many years of line upon line, precept upon precept, for as yet we are a long way from a public that is safety-minded.

More Energy Apart from Coal

AN interesting presentation of our sources of energy—anthracite, bituminous coal, domestic oil, imported oil, and water-power—was issued lately by the Bureau of Mines. To put these on a comparable basis the heat units contained in the production (and imports, in the case of oil) were computed, and for water-power the heat units in a quantity of coal that would produce that power. The report starts with 1819, at the beginning of our coal production, and runs forward by every tenth year, the record of individual years beginning with 1918.

There are three salient points: the great growth of the available energy, the large increase in the proportion of oil and gas in recent years, cutting down the proportion of coal, and what may be considered the rapid growth of water-power, considering the large capital outlay required.

The computation, it must be understood, is of energy, however that energy may be used—in heat-

ing buildings, smelting ores, melting or treating metals, generation of power, production of light, etc. All are in terms of B.t.u.

Last year shows a total of 22,815 trillion B.t.u., the same as 1920. Two of the intervening years were considerably lower and one, 1923, considerably higher. One may take 23,000 as our most recent average. In 1909 there was only 60 per cent as much and in 1899 only half as much as in 1909. There were very rapid percentage increases until, say, 15 years ago; the increases since have been relatively slow.

One must remember that the comparison in the case of the fuels is by way of the heat units contained in the production. Much progress has been made in getting results, and thus what we secure has been increasing much more than the production of the minerals. The reports of power generation by the public utilities have shown remarkable increases in efficiency in the past half dozen years.

As to the relationship between fuels: Oil and gas combined furnished 11.4 per cent of the heat units in 1889 and coal 88.6 per cent, while last year the distribution was 28.5 per cent for oil and gas and 71.5 per cent for coal. The increase in oil and gas heat units from 1889 to 1925 was 1180 per cent, while the increase in coal was 310 per cent It will be recognized that on the whole oil and gas are used more efficiently than coal, and they are more easily transported. Thus the benefit we get out of oil and gas relative to coal is much greater than is indicated by the mere figures of 28.5 for oil and gas and 71.5 for coal.

Finally, the report shows in an interesting way the increasing importance of water power. On the basis of trillions of heat units involved, water power with all its years of growth was only at 588 in 1913, while in 1924 it stood at 1167, thus doubling in 11 years, while in 1925 it stood at 1290. This represented 6.0 per cent as much energy as was contained in all the fuels of that year. In 1909 the proportion was 3.0 per cent, of a fuel production that was only two-thirds as great as that of last year.

Accidents as Production Checks

INDUSTRIAL accidents as affecting manufacturing efficiency should be considered not alone on the basis of casualties to workers which involve loss of time, but also on the basis of every sort of process interruption. The point is well stressed by Lewis A. Deblois, director of the safety division of the National Bureau of Casualty and Surety Underwriters, writing in *Survey*, the organ of the Associated Industries of Massachusetts. Mr. Deblois points out that anything, expected or unexpected, avoidable or unavoidable, that interrupts the process cycle tends to lower production and by so doing increases the ratio of fixed expense, otherwise overhead.

Some interruptions, of course, are not avoidable. For instance, it may be necessary to shut down a department or the entire plant. But theoretically the element of accident is wholly avoidable, and, to quote the article, "we must remember that in speaking of accidents we do not mean accidental injuries but the unexpected occurrences from which injuries may result. . . . We are very apt to concentrate our attention on accidental injuries—largely on tabulatable injuries—overlooking minor injuries and near-injury accidents."

Mr. Deblois's deductions as to the number of accidents, petty and important, of all descriptions, which occur in a manufacturing plant are of much interest. In fact, if the figures are anywhere near correct, they are astonishing. On the basis of one fatal accident there are five permanent disability cases and 110 tabulatable temporary disability cases, these being Hookstadt's modifications of the accepted American experience. Then, taking the average of the several plants of E. I. du Pont de Nemours & Co., for each single death and five permanent disabilities there are 34,800 minor disability cases where no loss of time occurs. Finally, Mr. Deblois makes the arbitrary ratio of 30,000 non-injury accidents to every tabulatable accident. To quote him further:

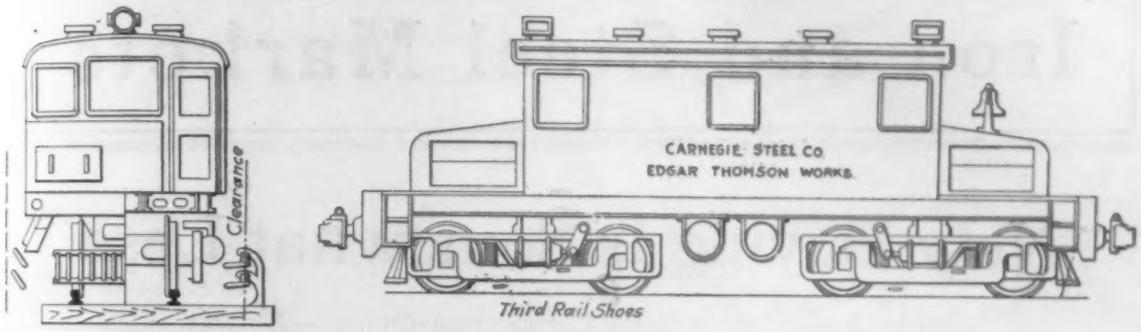
> We have seen that accidents, functioning as process interruptions, diminish operation efficiency and decrease output. Assume that we have 1000 men employed in an industrial process and that these men have an injury frequency rate of 20 per thousand workers per year. If our assumption on the relative number of non-injury accidents was correct, there would be 600,020 accidental process interruptions during the year. If their duration averaged only one minute the aggregate lost time would amount to 10,000 hours. Obviously then, the prevention of accidents, as distinct from the prevention of accidental injuries, has real economic possibilities.

The panacea is to eliminate every accident cause. Protection of the worker alone will not do it. The cause is to blame. Removing it not only prevents accidental injuries, but diminishes materially the great majority of unexpected process interruptions of every kind.

Let no one minimize the magnificent work already done in American industry in making safe the worker's employment. It is undisputed that a higher degree of manufacturing efficiency has resulted. The many successes were largely responsible for the national research which has been undertaken by the American Engineering Council. Mr. Deblois's idea is to carry the reform much further. He points out that very largely the progress has been made in large plants, employing over 1000 people, which represent only one-half of one per cent of the 196,000 manufacturing establishments of the country, as compared with 90 per cent which employ less than 100.

The best directed effort will be in introducing safety engineering more generally in the smaller works which have not yet thoroughly awakened to the need. To make the practice general it will be necessary, evidently, to show actual proofs that there is a definite relationship between safety and production efficiency, and that by safety is meant not only freedom from accidents that cause loss of time to workers, but freedom from accidents of every description that cause industry to pause.

Eighty-Ton Electric Locomotive Regarded as the Pioneer Installation of an Electric Unit of this Size in Steel Mill Service



To Use Large Electric Locomotive

80-Ton Unit for Carnegie Company's Edgar Thomson Works Will Transport 6000 Tons of Hot Metal Daily—A Pioneer Installation

BY R. L. KIMBALL*

THE 80-ton swivel-truck, third-rail type locomotive ordered by the Carnegie Steel Co., for use on the "hot metal elevated" at its Edgar Thomson works, Braddock, Pa., is the first electric locomotive of its size to be employed by a steel manufacturer for yard service. The service conditions are ideal for electrification. Operations are sufficient to keep the locomotive busy and at the same time are somewhat isolated from other yard work. Power for the third-rail system is available from the mill circuit.

The run over which this locomotive will operate is approximately half a mile long, extending from the "bull pen" to the mixer building. This track is known as the "hot metal elevated" as it passes over several other yard tracks and the tracks of the Baltimore & Ohio railroad. More than half of the run has a grade of 2.75 per cent, a portion of which lies in a curve of 300 ft. radius. This combination of a heavy grade and a sharp curve makes the operating conditions unusually severe.

The maximum train contemplated consists of five loaded ladles weighing 72 tons each and a 15-ton caboose. The locomotive must be capable of starting this train at the worst position on the run which is, of course, where the train is located on the heavy grade and curve. With a conservative factor of adhesion of 25 per cent, an adhesive weight on the drivers of 80 tons is required.

An average train will consist of four ladles, each containing 25 tons of metal, and will complete the cycle of one run in 20 min. This service is of 24-hr. duration seven days a week. The locomotive, therefore, must be of rugged construction to withstand such demands of service, and also have an ample margin electrically. All the spare capacity which is contemplated consists of one motor truck complete in all details including third-rail shoes and with motors installed.

The cycle of operation calls for several switching movements but is essentially as follows: Couple to loaded ladles in the "bull pen" and move out onto the "hot metal elevated" track, reverse, couple on caboose and proceed up the "elevated" with the caboose and ladles ahead. The caboose is switched out of the way at the upper end of the run and the ladles placed in the mixer building. The locomotive then returns with empty ladles and the caboose, placing the empty ladles in the cleaning shed. It is planned to transport 6000 tons of hot metal per day in this way.

Current will be collected from a double third-rail at 230 volts. For the present at least, the power will be taken from the mill power system, and as it is undesirable to ground the present circuit, positive and negative third-rails will be used. These will be located both on the same side and outside of the running rails. They are the under-running type and will be placed one above the other. This type of third-rail is considered inherently easier to protect and hence more suitable for yard work. Considerable care has been taken by the operating engineers in laying out the third-rail location to eliminate the necessity of the third-rail shoes approaching the rail from the side as, for instance, might occur at a cross-over. This eliminates the need for side incline rails at such points.

Due to its required height and desired clearance from steam locomotive steps and cylinders the third-rail has been located at an unusual distance from the track. If it were permissible to ground one side of the locomotive, power supply requiring only one third-rail and using the running rails as the return circuit, the third-rail could be brought considerably closer to the running rail. This would be desirable as it would permit operation at closer quarters.

The relative locations of the third-rail shoes are shown on the locomotive outlines. As there are some special considerations involved in their arrangement they may well be noted here. It will be seen that there are two shoes, one positive and one negative, on each truck to facilitate bridging necessary gaps in the third-rail. They are located on different horizontal planes. The end view shows the shoes on the right in the operating position while those on the left are raised. It is necessary that the raising and lowering of the shoes be controlled from the operating compartment of the locomotive in order to meet certain clearance restrictions.

Much credit is due the engineers of the Carnegie Steel Co. for undertaking this record installation, which represents an interesting achievement in steel mill railroad electrification.

*General engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh.

Timken Roller Bearing Co. Orders Electric Furnaces

As a part of its program for the building of an electric steel plant at Canton, Ohio, to cost about $2,000,000, the Timken Roller Bearing Co. has ordered three Heroult electric furnaces from the American Bridge Co. Two are to be of 25 tons capacity and one of 7 tons. They will be installed in the fall. The plant will also have an open-hearth furnace of large capacity.

Iron and Steel Markets

New Buying Is Somewhat Less

Slight Reduction in Steel Corporation Output—Detroit Sale of Bars at 1.90c.—Belgian Mill Takes 4700 Tons—Wire Advance Doubted

STEEL mill operations in the leading districts continue at the high rate of the first half of August, but the week has brought some curtailment of finishing mill output due to hot weather. Specifications in good volume are still the rule, though in respect to new business some producers find a slight recession from the rate of bookings earlier in the month.

In bars, sheets, and some other products in which the mid-year restocking movement was pronounced, many consumers' needs are provided for through September and fourth quarter business is still in abeyance.

Steel Corporation production of steel ingots this week is at somewhat under 85 per cent of capacity and, in view of the recent accumulation of steel-making pig iron, three of the corporation's blast furnaces have gone out—one at Gary, one at Cleveland and one in the Pittsburgh district. Against these stoppages is the blowing in of one Carrie furnace at Rankin, Pa., and of one independent blast furnace in the Youngstown district.

Pipe and tin plate lead among finished products for high rate of production, the demand for lap-welded pipe being such that the National Tube Co. will start up two furnaces at its Benwood, W. Va., mill, which has been idle since early in the year. Much line pipe work is still on the books and there is a revived inquiry for 100,000 tons of pipe for a projected line from Amarillo, Texas, to Kansas City.

Pressure for tin plate shipments has been unusually strong and mills are crowding operations. Some makers who also make sheets have had to divert steel from the sheet department to the tin mills to meet demands upon them. Some producers now hold tin mill black plate firm at 3.15c., Pittsburgh, because of the urgent need of plate for tinning.

Automobile companies in some cases have placed more liberal orders lately, though the improvement has not extended as yet to alloy steel. One Detroit transaction of the week has attracted attention—a 3000-ton purchase of bars at 1.90c., Pittsburgh.

Again the efforts of some producers of sheets to lift the market are offset by authentic reports of low prices. On black sheets 3.05c., Pittsburgh, is still possible, and on galvanized 4.25c. is shaded.

Automobile buying of cold-rolled strip steel has helped order books, and prices are firmer in some districts. In others the large capacity of such mills still causes aggressive selling.

While talk of higher prices for wire products is revived, buyers treat it with reserve in view of the inability of wire mills to get above a 60 per cent operation.

Plate mills at Chicago have just taken 7000 tons for oil tankage, but the lack of car work is felt in that market.

Of the week's structural awards, exceeding 34,000 tons, the largest is 8900 tons for a new plant for the Oakland Motor Car Co., Pontiac, Mich. Pending projects total 27,000 tons, including 5000 tons for a New York apartment building to be awarded this week. In New York City there is some easing off in structural demand.

The increasing penetration of foreign steel into seaboard districts is more and more a matter of comment. Belgian makers of reinforcing bars took 4700 tons of the 6500 tons just placed for the Conowingo dam near Havre de Grace, Md. The price was about 1.75c., duty paid, or $12 a ton below domestic bars.

At San Francisco imports of foreign steel are increasing steadily, reinforcing bars selling at 1.60c., shapes at 1.75c. and nails at $3.10.

The proposed European steel agreement for allotment of export tonnage is likely to be limited to Germany, France, Belgium and Luxemburg. Price fixing is not aimed at, nor any aggressive concert against American or British export trade, the main purpose being the protection of the member countries against each other.

Following the stronger tone in scrap markets a week ago, two sales of heavy melting steel have been made to steel plants in the Pittsburgh district at $18, but $17.50, last week's price, is the extent of bids today. In the East there has been no further consumer buying.

The appearance in the Pittsburgh market of two steel companies, each inquiring for 15,000 tons a month of blast furnace coke for the remainder of the year, has lessened the prospect for cheap coke for merchant blast furnaces in the last quarter. Meanwhile the export demand for coal is giving some Connellsville producers a fair operation of their mines and more profit than could be had from the sale of their coke.

Unusual stability of prices has held THE IRON AGE pig iron and finished steel composite prices unchanged for five and eight weeks respectively. That for pig iron, $19.46, remains at the low point of the year. Finished steel, at 2.431c., is about midway between the year's high and low points.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

For Early Delivery

Pig Iron, Per Gross Ton:	Aug. 17, 1926	Aug. 10, 1926	July 20, 1926	Aug. 18, 1925
No. 2, Philadelphia	$21.76	$21.76	$21.76	$21.26
No. 2, Valley Furnace	17.50	17.50	17.75	18.50
No. 2 Southern, Cin'ti	24.19	24.19	24.19	22.55
No. 2, Birmingham	21.00	21.00	21.00	18.00
No. 2 foundry, Chicago*	21.00	21.00	21.00	20.50
Basic, del'd, eastern Pa.	21.00	21.00	21.00	20.50
Basic, Valley furnace	17.50	17.50	17.50	18.00
Val'y Bessemer, del'd P'gh.	19.76	19.76	20.26	20.76
Malleable, Chicago*	21.00	21.00	21.00	20.50
Malleable, Valley	17.50	17.50	17.75	18.50
Gray forge, Pittsburgh	18.76	18.76	19.01	19.76
L. S. charcoal, Chicago	29.04	29.04	29.04	29.04
Ferromanganese, furnace	88.00	88.00	88.00	115.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	34.00	34.00	34.00	35.84
Bess. billets, Pittsburgh	35.00	35.00	35.00	35.00
O.-h. billets, Pittsburgh	35.00	35.00	35.00	35.00
O.-h. sheet bars, P'gh	36.00	36.00	36.00	35.00
Forging billets, base, P'gh.	40.00	40.00	40.00	40.00
O.-h. billets, Phila.	40.30	40.30	40.30	40.30
Wire rods, Pittsburgh	45.00	45.00	45.00	45.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	1.90	1.90	1.90	1.90
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.22	2.22	2.22	2.17
Iron bars, Chicago	2.00	2.00	2.00	1.90
Steel bars, Pittsburgh	2.00	2.00	2.00	1.90
Steel bars, Chicago	2.10	2.10	2.10	2.10
Steel bars, New York	2.34	2.34	2.34	2.24
Tank plates, Pittsburgh	1.90	1.90	1.90	1.80
Tank plates, Chicago	2.10	2.10	2.10	2.10
Tank plates, New York	2.24	2.24	2.24	2.14
Beams, Pittsburgh	2.00	2.00	2.00	1.90
Beams, Chicago	2.10	2.10	2.10	2.10
Beams, New York	2.34	2.34	2.34	2.24
Steel hoops, Pittsburgh	2.50	2.50	2.50	2.40

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Sheets, Nails and Wire,	Aug. 17, 1926	Aug. 10, 1926	July 20, 1926	Aug. 18, 1925
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	3.10	3.10	3.10	3.15
Sheets, black, No. 28, Chicago dist. mill	3.25	3.25	3.25	3.30
Sheets, galv., No. 28, P'gh.	4.25	4.20	4.25	4.20
Sheets, galv., No. 28, Chicago dist. mill	4.40	4.40	4.40	4.35
Sheets, blue, 9 & 10, P'gh.	2.30	2.30	2.30	2.30
Sheets, blue, 9 & 10, Chicago dist. mill	2.40	2.40	2.40	2.40
Wire nails, Pittsburgh	2.65	2.65	2.65	2.65
Wire nails, Chicago dist. mill	2.70	2.70	2.70	2.70
Plain wire, Pittsburgh	2.50	2.50	2.50	2.50
Plain wire, Chicago dist. mill	2.55	2.55	2.55	2.55
Barbed wire, galv., P'gh.	3.35	3.35	3.35	3.35
Barbed wire, galv., Chicago dist. mill	3.40	3.40	3.40	3.40
Tin plate, 100 lb. box, P'gh	$5.50	$5.50	$5.50	$5.50
Old Material, Per Gross Ton:				
Carwheels, Chicago	$16.00	$16.00	$16.00	$17.50
Carwheels, Philadelphia	17.50	17.50	17.00	18.50
Heavy steel scrap, P'gh	17.50	17.50	17.00	19.00
Heavy steel scrap, Phila.	16.00	16.00	15.25	16.50
Heavy steel scrap, Ch'go	14.00	14.00	14.50	16.50
No. 1 cast, Pittsburgh	17.00	16.50	16.00	17.50
No. 1 cast, Philadelphia	17.50	17.50	17.00	18.00
No. 1 cast, Ch'go (net ton)	17.00	17.00	17.50	17.50
No. 1 RR. wrot. Phila.	18.00	18.00	16.50	17.50
No. 1 RR. wrot. Ch'go (net)	13.50	13.50	13.50	16.25
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.90	$2.85	$3.00	$3.20
Foundry coke, prompt	4.00	4.00	4.00	4.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	14.50	14.62½	14.25	14.87½
Electrolytic copper, refinery	14.25	14.25	14.00	14.50
Zinc, St. Louis	7.30	7.30	7.45	7.62½
Zinc, New York	7.65	7.65	7.80	7.97½
Lead, St. Louis	8.80	8.75	8.50	9.50
Lead, New York	8.90	9.00	8.65	9.50
Tin (Straits), New York	64.75	66.00	63.37½	57.50
Antimony (Asiatic), N. Y.	16.75	17.00	14.50	17.50

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Mill Operations at High Rate—Scrap Advance Halted

PITTSBURGH, Aug. 17.—Steel business is good, and there is no occasion to qualify this by saying "for the time of year." With enough business to sustain an ingot production of 85 per cent of capacity, denoting an even higher engagement of finishing mill capacity, since the district has more finishing than steel-making facilities, the current demand stands comparison with that for any time of the year.

There is substantially full engagement of lap-welded pipe capacity, and enough of the butt-weld furnaces are going to give that division of the steel industry an average operation of at least 90 per cent. There is an operation of tin mills of between 85 and 90 per cent of practical capacity, while sheet mills and bar and structural mills are running from 80 to 85 per cent. Strip steel production is estimated at between 80 and 85 per cent of average capacity and at about 65 to 70 per cent of theoretical capacity. The poorest engagement is in plate and wire mills, the latter being operated at somewhere between 50 and 60 per cent. The rate is somewhat higher in plate mills, making allowance for a number of mills that are impossible of profitable operation at today's prices and those down because manufacturers are putting the steel into more profitable channels.

There has been a slight average gain in ingot output in this and nearby districts in the past week, and prices are generally unchanged. The principal exception is cold-rolled strip, for which 3.60c., base, Pittsburgh, is strictly the ordinary tonnage quotation. Sheet makers seem to be making progress in putting the market upon a steadier basis, being aided by a more active demand, while interference to production by hot weather has given the mills a backlog and lengthened out delivery promises. Some wire mills also seem to have stronger price ideas on nails and those products that usually move along with nails.

Contrasting sharply with conditions in the steel market are those of the merchant pig iron market, where a lack of balance between supply and demand keeps prices at low and unprofitable levels, in spite of the efforts of some producers to bring about conditions whereby there would be at least a return of a new dollar for an old one. A stronger market in coke and the prospect of last quarter tonnages commanding substantially higher prices than those now moving to the furnaces have not inspired much fear among pig iron consumers of higher iron prices. Correction of the situation seems to lie in a further reduction of production.

The upward swing in scrap prices has been halted, and one of the contributary causes is the low pig iron market. Steel makers argue that they cannot see higher prices for old material than pig iron is costing them to produce or would command if they wanted to sell some.

Pig Iron.—An earnest effort on the part of some merchant producers to put prices on a more remunerative level does not yet appear to be finding general support, and with the market plainly two-sided as to the price ideas, it is impossible to make any change in quotations from those of a week ago. Sales of No. 2 foundry iron continue to be made at $18, Valley furnace, among them one of 200 tons for shipment to Salem, Ohio, and that price has been named by a number of producers on 2000 tons for shipment to the Cleveland foundry of the Westinghouse Electric & Mfg. Co. Against this, however, is the fact that a local melter, seeking 1500 tons for shipment over the remainder of the year, has quotations of $17.50, Valley furnace, and a report that even $17 has been quoted. The same price situation exists in other grades. As against small-lot transactions in Bessemer iron at $19, Valley furnace, is the willingness of at least one other producer to take business at $18. Malleable iron has sold at as high as $18.50, and as low as $17.50. There has not been much test of the market on basic iron, other than an unsuccessful effort on the part of a melter to place a fourth quarter tonnage at $17.50. It is the testimony of one steel company with surplus iron for sale that basic iron cannot be sold at $17.50, Valley furnace. It would seem as though pig iron could not sell below present prices and allow some of the furnaces now in production to stay in. The ore situation appears strong, and the possibility that shipments will be below requirements has checked the price concessions that were being made a short time ago. The presence in the market of two steel companies for good-sized blocks of furnace coke for shipment over the remainder of the year has strengthened that market and lessened the prospect for cheap coke for merchant furnaces in the final quarter of the year. Pig iron prices here are materially lower than at any other distributing market in the country, but neither this nor the other factors seem to have become effective in actually stiffening prices. The trouble is fundamental, in that the supply of iron is too great for consumption. The Carnegie Steel Co. late last week put on one of its Carrie furnaces and the Youngstown Sheet & Tube Co. is getting ready to start up one of its Hubbard stacks. There are now in production in this and nearby districts 81 of a total of 127 furnaces; at the year's peak 96 were in blast.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$17.50 to $18.00
Bessemer	18.00 to 19.00
Gray forge	17.00 to 17.50
No. 2 foundry	17.50 to 18.00
No. 3 foundry	17.00 to 17.50
Malleable	17.50 to 18.50
Low phosphorus, copper free	27.50

Ferroalloys.—There are only occasional inquiries for ferromanganese or the other commonly used ferroalloys, and these usually are for single carloads. Important consumers are fully covered against their requirements over the remainder of the year, and getting ample supplies is merely a matter of specification. The recent reduction in the price of British ferromanganese puzzles the trade here, since a price of $100, Atlantic seaboard, could hardly interest consumers covered to the end of this year at $12 a ton less. The object is probably to let American consumers know that the British price is not inflexible. Domestic spiegeleisen of 19 to 21 per cent manganese content is scarce, with the leading commercial producer shipping 16 to 19 per cent material to customers willing to take that grade in place of the higher grade. Prices are given on page 515.

Semi-Finished Steel.—A sale of 600 tons of sheet bars has been made by a Youngstown maker to an Ohio River sheet and tin plate manufacturer at the full price of $36, Pittsburgh. There are occasional sales of forging quality billets, but generally open market transactions in semi-finished steel are few and small, because so much of the tonnage moves on requirement contracts between producers and non-integrated manufacturers. Good business in the finished products is fully reflected in the specifications against those contracts. Prices are firm.

Wire Products.—Business continues to make a good showing for the time of year, and it is now believed that this year's shipments will equal those for 1925. To date they have been somewhat less, due to the fact that in the first three months of last year shipments were almost of record proportions, while this year saw no big spring movement but takings more in keeping with actual demands. Prices are very steady. Spring dating is being given woven wire fence effective from Aug. 16. There is no change in prices and the discounts are the same as a year ago, or 5 per cent off for payment by Sept. 10, 2 per cent for payment by March 10, 1927, and the net price May 1, 1927, for lots of 500 rods or more. Prices are given on page 513.

Rails and Track Supplies.—Business in these lines is no better than it usually is at this time of the year, when demands run chiefly to fill in tonnages and the railroads are engaged in budgeting their future requirements. The common expectation is a good rail tonnage, because of the heavy traffic over the past year, but inquiries are not looked for until after Labor Day. Light rails are slow of sale in spite of an improved coal situation, and only small lots of billet rails can be sold at more than $34 per gross ton, mill. Prices are given on page 513.

Tubular Goods.—The size of the demand for lap-welded pipe is indicated by the fact that the National Tube Co. next Monday will start up its two furnaces at its Riverside works, Benwood, W. Va. This plant has been idle since early in the year, or since the Gary works went into production, and has been regarded as an emergency unit. Skelp will be furnished from the company's McKeesport, Pa., plant, and there will be no resumption of operations at the blast furnaces or steel works at Benwood. Call for lap-welded pipe has as yet shown no abatement, and in the butt-welded sizes the demand is persistent if not in quite so heavy volume as recently. The mills still have much line pipe to

THE IRON AGE Composite Prices

Finished Steel

Aug. 17, 1926, 2.431c. Per Lb.

One week ago	2.431c.
One month ago	2.431c.
One year ago	2.396c.
10-year pre-war average	1.689c.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Low	
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18
1924	2.789c.,	Jan. 15;	2.460c.,	Oct. 14
1923	2.824c.,	April 24;	2.446c.,	Jan. 2

Pig Iron

Aug. 17, 1926, $19.46 Per Gross Ton

One week ago	$19.46
One month ago	19.50
One year ago	19.04
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1926	$21.54,	Jan. 5;	$19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7
1924	22.88,	Feb. 26;	19.21,	Nov. 3
1923	30.86,	March 20;	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base Per Lb.
F.o.b. Pittsburgh mills	2.00c. to 2.10c.
F.o.b. Chicago	2.10c.
Del'd Philadelphia	2.32c.
Del'd New York	2.34c.
Del'd Cleveland	2.19c.
F.o.b. Birmingham	2.15c. to 2.25c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills	2.00c. to 2.10c.

Rail Steel

F.o.b. mill	1.80c. to 1.90c.
F.o.b. Chicago	2.00c.

Iron

Common iron, f.o.b. Chicago	2.00c.
Refined iron, f.o.b. P'gh mills	3.00c.
Common iron, del'd Philadelphia	2.22c.
Common iron, del'd New York	2.24c.

Tank Plates

	Base Per Lb.
F.o.b. Pittsburgh mill	1.90c.
F.o.b. Chicago	2.10c.
F.o.b. Birmingham	2.05c. to 2.15c.
Del'd Cleveland	2.09c.
Del'd Philadelphia	2.22c.
Del'd New York	2.24c.
C.i.f. Pacific ports	2.25c. to 2.30c.

Structural Shapes

	Base Per Lb.
F.o.b. Pittsburgh mill	2.00c. to 2.10c.
F.o.b. Chicago	2.10c.
F.o.b. Birmingham	2.15c. to 2.25c.
Del'd Cleveland	2.19c.
Del'd Philadelphia	2.22c. to 2.32c.
Del'd New York	2.24c. to 2.34c.
C.i.f. Pacific ports	2.30c. to 2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base Per Lb.
All gages, narrower than 6 in., P'gh	2.50c.
All gages, 6 in. and wider, P'gh	2.30c.
All gages, 6 in. and narrower, Chicago	2.60c.
All gages, wider than 6 in., Chicago	2.50c.
Cotton ties, f.o.b. Atlantic ports, per bundle of 45 lb.	$1.22
Cotton ties, f.o.b. Gulf ports, per bundle of 45 lb.	1.20

Cold-Finished Steel

	Base Per Lb.
Bars, f.o.b. Pittsburgh mills	2.50c.
Bars, f.o.b. Chicago	2.50c.
Bars, Cleveland	2.55c.
Shafting, ground, f.o.b. mill	*2.70c. to 3.00c.
Strips, f.o.b. Pittsburgh mills	3.60c.
Strips, f.o.b. Cleveland mills	3.40c. to 3.60c.
Strips, delivered Chicago	3.90c.
Strips, f.o.b. Worcester mills	3.75c.

*According to size.

Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails	$2.65
Galv'd nails, 1-in. and longer	4.65
Galv'd nails, shorter than 1 in.	4.90
Galvanized staples	3.35
Polished staples	3.10
Cement coated nails	2.65

	Base Per 100 Lb.
Bright plain wire, No. 9 gage	$2.50
Annealed fence wire	2.65
Spring wire	3.50
Galv'd wire, No. 9	3.10
Barbed wire, galv'd	3.35
Barbed wire, painted	3.10

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass., mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Woven Wire Fence

	Base to Retailers Per Net Ton
F.o.b. Pittsburgh	$65.00
F.o.b. Cleveland	65.00
F.o.b. Anderson, Ind.	66.00
F.o.b. Chicago district mills	67.00
F.o.b. Duluth	68.00
F.o.b. Birmingham	65.00

Sheets

Blue Annealed

	Base Per Lb.
Nos. 9 and 10, f.o.b. Pittsburgh	2.25c. to 2.30c.
Nos. 9 and 10, f.o.b. Ch'go dist. mill	2.40c.
Nos. 9 and 10, del'd Philadelphia	2.62c.

Box Annealed, One Pass Cold Rolled

No. 28, f.o.b. Pittsburgh	3.05c. to 3.15c.
No. 28, f.o.b. Ch'go dist. mill	3.25c.
No. 28, del'd Philadelphia	3.42c. to 3.47c.

Galvanized

No. 28, f.o.b. Pittsburgh	4.20c. to 4.30c.
No. 28, f.o.b. Chicago dist. mill	4.40c.
No. 28, del'd Philadelphia	4.57c. to 4.62c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	3.10c. to 3.15c.
No. 28, f.o.b. Chicago dist. mill	3.25c.

Automobile Body Sheets

No. 28, f.o.b. Pittsburgh	4.20c.

Long Ternes

No. 28, 8-lb. coating, f.o.b. mill	4.75c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.50
Standard cokes, f.o.b. Gary and Elwood, Ind.	5.60

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)

(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base	$11.40
8-lb. coating I.C.	11.70
15-lb. coating I.C.	14.85
20-lb. coating I.C.	$16.20
25-lb. coating I.C.	17.90
30-lb. coating I.C.	19.45
40-lb. coating I.C.	21.65

Alloy Steel Bars

(F.o.b. Pittsburgh or Chicago)

S. A. E. Series Numbers		Base Per 100 Lb.
2100*	(1½% Nickel, 0.10% to 0.20% Carbon)	$3.20 to $3.25
2300	(3½% Nickel)	4.40 to 4.50
2500	(5% Nickel)	5.50 to 5.65
3100	(Nickel Chromium)	3.40 to 3.50
3200	(Nickel Chromium)	5.00 to 5.25
3300	(Nickel Chromium)	7.00 to 7.25
3400	(Nickel Chromium)	6.25 to 6.50
5100	(Chromium Steel)	3.40 to 3.50
5200*	(Chromium Steel)	7.00 to 7.50
6100	(Chrom. Vanadium bars)	4.20
6100	(Chrom. Vanad. spring steel)	3.50
9250	(Silicon Manganese spring steel)	3.20 to 3.25
	Carbon Vanadium (0.45% to 0.55% Carbon, 0.15% Vanad.)	4.10 to 4.20
	Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chrom., 0.15 Vanad.)	4.30
	Chromium Molybdenum bars (0.80—1.10 Chrom., 0.25—0.40 Molyb.)	4.25 to 4.35
	Chromium Molybdenum bars (0.50—0.70 Chrom., 0.15—0.25 Molyb.)	3.40 to 3.50
	Chromium Molybdenum spring steel (1—1.25 Chrom., 0.30—0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$45.00
Light (from billets), f.o.b. mill	$34.00 to 35.00
Light (from rail steel), f.o.b. mill	32.00 to 33.00
Light (from billets), f.o.b. Ch'go mill	34.00 to 35.00

Track Equipment

(F.o.b. Mill)

	Base Per 100 Lb.
Spikes, ⅜ in. and larger	$2.90 to $3.00
Spikes, ½ in. and smaller	2.90 to 3.25
Spikes, boat and barge	3.25
Track bolts, all sizes	3.90 to 4.50
Tie plates, steel	2.25 to 2.35
Angle bars	2.75

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv
⅛	45	19½	¼ to ⅜	+11	+30
¼ to ⅜	51	31½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1¼	30	12
1 to 3	62	50½			

Lap Weld

2	55	43½	2	28	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ to ⅜	+19	+34
¼ to ⅜	47	30½	½	21	7
½	53	42½	¾	25	12
¾	58	47½	1 to 1¼	30	14
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	7
9 and 10	45	32½	9 to 12	16	3
11 and 12	44	31½			

To the large jobbing trade the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to large jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.	37	1½ in.	+13
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 6
3 in.	40	2 to 2¼ in.	— 3
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	48	3½ to 4½ in.	— 9

Beyond the above discounts, 5 to 7 fives extra are given on lap welded steel tubes and 2 tens to 2 tens and 1 five on charcoal iron tubes.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	60	3 in.	45
1¼ to 1½ in.	52	3½ to 3½ in.	47
1¾ in.	36	4 in.	50
2 to 2¼ in.	31	4½, 5 and 6 in.	45
2½ to 2¾ in.	39		

Hot Rolled

2 and 2¼ in.	34	3¼ and 3½ in.	50
2½ and 2¾ in.	42	4 in.	55
3 in.	48	4½, 5 and 6 in.	48

Less carloads, 4 points less. Add $3 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercially exact lengths. Warehouse discounts on small lots are less than the above.

work on, and there has been a revival of the inquiry for the 450-mile line to run from Amarillo, Tex., to Kansas City, this time coming from the Doherty interests. The first inquiry was from the Hope Engineering & Supply Co., suggesting that the Standard Oil Co. of New Jersey was behind the project. This line would mean large outside-diameter pipe, totaling approximately 100,000 tons. Boiler tube business is only fair, with seamless steel tubes making a better showing than welded goods. Discounts are given on page 513.

Sheets.—Makers generally report incoming business to be running ahead of shipments, and with some accumulating of orders there is less pressure to sell and slightly stronger prices. In this district, 4.25c., base Pittsburgh, now is as low as any of the mills will go on galvanized sheets and 4.30c. is the more commonly quoted price. None of the mills will go below 3.10c., base Pittsburgh, on black sheets, and most of them want 3.15c., and no small part of recent business is at the latter price. There has not been much shading of 2.30c., base Pittsburgh, on blue annealed sheets for some time.

Tin Plate.—Yesterday was the first specification day on October shipments on contracts. It now does not look as though there would be much of a letdown in mill operations over the remainder of the year, since tonnage released will give the mills a good schedule through October and by November there will be enough early 1927 business to keep them going. Pressure for delivery of tin plate for packers' cans still is strong, and the need of tin plate for that purpose also finds expression in a good demand for stock items. Mills that have the capacity open do not have to hunt business, because the export demand remains good, although it is entirely for early delivery. Welsh tin mills are operating better, due to the fact that they can get imported coal, but they still are running well below normal.

Cold-Finished Steel Bars and Shafting.—Demand, while strictly for the early requirements of buyers, is remarkably well maintained in the screw stock sizes. The automobile parts makers are busier than they were early in the summer, and other consuming industries are buying more freely. Prices are very steady.

Steel and Iron Bars.—There is not very much new business in steel bars, but specifications on contracts continue at a very steady gait and there is still a high rate of mill engagement in this and nearby districts. The ordinary tonnage price still is 2c., base Pittsburgh, with 2.10c. obtainable on carload lots running to more than a few sizes. Iron bars are slow and barely steady.

Hot-Rolled Flats.—There is a good demand, especially for the sizes finding use in automobile manufacture. Prices are well maintained. They are given on page 513.

Cold-Rolled Strips.—Prices, except on small lots, are not very well defined. The small lot price is 3.60c., base Pittsburgh or Cleveland, and most of the current business is of that kind. No really desirable tonnages lately have come up, and makers here profess not to know what prices large lots would bring out. Competition for business is as sharp as it has been. The market is quotable at 3.60c., Pittsburgh, subject to concessions. Orders and specifications so far this month have not quite equalled those for the same period last month.

Structural Steel.—Mills still are getting good specifications on large structural shapes and a fair sprinkling of new business, chiefly of small tonnages calling for early delivery against projects that must be completed before cold weather. The market is steady at 2c., base Pittsburgh.

Plates.—In the absence of much railroad car buying, plate-making capacity is not heavily taxed by demands for other purposes. The market, however, is well maintained at 1.90c., base Pittsburgh, because most plate makers are producers of other steel products and are diverting steel to more profitable channels.

Old Material.—Two other mills, besides the one mentioned a week ago, have paid $18 for heavy melting steel in the past week. The purchases made in the past fortnight have taken the several buyers out of the market, and today $18 was merely an asking price with no bids of more than $17.50. One company which bought in the past week and now is said to have a 90-day supply on hand, will not pay more than $17 and dealers who sold are naming that price. The market seems to have struck one of those resting places that come from time to time in all price movements either up or down, and heavy melting grade is quotable at the same prices as a week ago. Some buying by steel foundries has stiffened the market on the railroad specialties, and turnings are maintaining their recent price strength. The Baltimore & Ohio Railroad is taking bids until noon Aug. 23 on 19,280 gross tons of scrap, including 4500 tons of miscellaneous rails.

We quote for delivery to consumer's mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton

Heavy melting steel	$17.50 to $18.00
No. 1 cast, cupola size	17.00 to 17.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	18.50 to 19.50
Compressed sheet steel	16.50
Bundled sheets, sides and ends	15.50
Railroad knuckles and couplers	19.50 to 20.00
Railroad coil and leaf springs	19.50 to 20.00
Low phosphorus blooms and billet ends	21.00 to 21.50
Low phosphorus mill plates	20.50 to 21.00
Low phosphorus, light grade	18.00 to 18.50
Low phosphorus punchings	18.50 to 19.00
Steel car axles	22.00 to 22.50
Cast iron wheels	16.50 to 17.00
Rolled steel wheels	19.50 to 20.00
Machine shop turnings	13.00 to 13.50
Short shoveling turnings	13.50 to 14.00
Sheet bar crops	18.00 to 19.00
Heavy steel axle turnings	15.50 to 16.00
Short mixed borings and turnings	13.00 to 13.50
Heavy breakable cast	16.50 to 17.00
Cast iron borings	13.00 to 13.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	17.50 to 18.00
Railroad or automobile malleable scrap	18.00 to 18.50

Bolts, Nuts and Rivets.—Steady demand still is noted for bolts and nuts, and there is a fair demand for rivets. Bolt and nut prices are steady, but there is still considerable competition for business in rivets, notably large ones, and $2.60, base, per 100 lb., Pittsburgh, can hardly be regarded as the ruling price from a tonnage standpoint. Prices and discounts are given on page 515.

Coke and Coal.—Furnace coke prices are looking up as a result of two steel company inquiries, each for 15,000 tons a month for shipment over the remainder of the year, and also because of the fact that the export demand for coal is giving some of the Connellsville producers a fair operation of their mines and more profit than could be obtained from the sale of coke. A local steel company, which recently inquired

(*Concluded on page* 530)

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Tank plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforced steel bars	2.90c.
Black sheets (No. 28 gage), 25 or more bundles	4.00c.
Galvanized sheets (No. 28 gage), 25 or more bundles	5.00c.
Blue annealed sheets (No. 10 gage), 25 or more sheets	3.55c.
Cold-finished shafting and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c.
Spikes, large	3.30c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Bolts, track	4.90c.
Wire, black soft annealed, base per 100 lb.	$3.00
Wire, galvanized soft, base per 100 lb.	3.00
Common wire nails, per keg	3.00
Cement coated nails	3.05

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F. o. b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rolling, 4-in. and over	$35.00
Rolling, 2-in. and smaller	36.00
Forging, ordinary	40.00
Forging, guaranteed	45.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer	$36.00

Slabs

	Per Gross Ton
8 in. x 2 in. and larger	$35.00
6 in. x 2 in. and smaller	36.00

Skelp

	Per Lb.
Grooved	1.90c.
Sheared	1.90c.
Universal	1.90c.

Wire Rods

	Per Gross Ton
*Common soft, base	$45.00
Screw stock	$5.00 per ton over base
Carbon 0.20% to 0.40%	3.00 per ton over base
Carbon 0.41% to 0.55%	5.00 per ton over base
Carbon 0.56% to 0.75%	7.50 per ton over base
Carbon over 0.75%	10.00 per ton over base
Acid	15.00 per ton over base

*Chicago mill base is $46. Cleveland mill base, $45.

Prices of Raw Materials

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.55
Old range non-Bessemer, 51.50% iron	4.40
Mesabi Bessemer, 51.50% iron	4.40
Mesabi non-Bessemer, 51.50% iron	4.25
High phosphorus, 51.50% iron	4.15

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian	9.50c. to 10c.
Iron ore, Swedish, average 66% iron	9.50c.
Manganese ore, washed, 51% manganese, from the Caucasus	40c. to 42c.
Manganese ore, high grade, nominal	35c. to 44c.
Tungsten ore, high grade, per unit, in 60% concentrates	$11.75 to $12.50
	Per Ton
Chrome ore, Indian basic, 48% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.50
	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.90 to $3.15
Foundry, f.o.b. Connellsville prompt	4.00 to 4.50
Foundry, by-product, Ch'go ovens	9.75
Foundry, by-product, New England, del'd	12.00
Foundry, by-product, Newark or Jersey City, delivered	9.59 to 10.77
Foundry, Birmingham	5.50 to 6.00
Foundry, by-product, St. Louis or Granite City	10.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.75
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Mine run gas coal, f.o.b. Pa. mines	1.85 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.10 to 1.20
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.30

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd.	$88.00 to $95.00
Foreign, 80%, Atlantic or Gulf port, duty paid	88.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$32.00 to $34.00
Domestic, 16 to 19%	31.00 to 33.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$85.00 to $87.50
75%	145.00 to 150.00

Per Gross Ton Furnace		*Per Gross Ton Furnace*	
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	$45 to 46.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10%	$33.00	12%	$37.00
11%	35.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
6%	$25.50	10%	$31.00
7%	26.50	11%	33.00
8%	27.50	12%	35.00
9%	29.00		

Other Ferroalloys

Ferrotungsten, per lb. contained metal, del'd	$1.05 to $1.20
Ferrochromium, 4% carbon and up, 60 to 70% Cr., per lb. contained Cr. delivered	11.50c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.25 to $4.00
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per net ton	$91.00
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per net ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines	$18.00
No. 2 lump, Illinois and Kentucky mines	$20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid,	$17.50 to $17.75
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	$32.50

Fire Clay

	Per 1000 f.o.b. Works	
	High Duty	Moderate Duty
Pennsylvania	$40.00 to $43.00	$33.00 to $40.00
Maryland	43.00 to 46.00	38.00 to 40.00
New Jersey	55.00 to 75.00	
Ohio	40.00 to 43.00	33.00 to 40.00
Kentucky	40.00 to 43.00	35.00 to 40.00
Illinois	40.00 to 43.00	35.00 to 38.00
Missouri	40.00 to 43.00	35.00 to 38.00
Ground fire clay, per ton	6.50 to 7.50	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$40.00
Chicago	40.00
Birmingham	50.00
Silica clay, per ton	$8.00 to 9.00

Magnesite Brick

	Per Net Ton
Standard size, f.o.b. Baltimore and Chester, Pa.	$45.00
Grain magnesite, f.ob. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00 to $48.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

(Less-than-Carload Lots)

(F.o.b. Pittsburgh, Cleveland, Birmingham and Chicago)

	Per Cent Off List
Machine bolts, small, rolled threads	60 and 10
Machine bolts, all sizes, cut threads	50, 10 and 10
Carriage bolts, smaller and shorter, rolled threads	50, 10 and 10
Carriage bolts, cut threads, all sizes	50 and 10
Eagle carriage bolts	65 and 10
Lag bolts	60, 10 and 10
Plow bolts, Nos. 3 and 7 heads	50 and 10
(Extra of 20% for other style heads)	
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.,	45, 10 and 5
Larger and longer sizes	45, 10 and 5
Bolt ends with hot-pressed nuts	50, 10 and 10
Bolt ends with cold-pressed nuts	45, 10 and 5
Hot-pressed nuts, blank and tapped, square,	4.00c. per lb. off list
Hot-pressed nuts, blank or tapped, hexagons,	4.40c. per lb. off list
C.p.c. and t. square or hex. nuts, blank or tapped	4.10c. per lb. off list
Washers*	6.50c. to 6.25c. per lb. off list

*F.o.b. Chicago and Pittsburgh.

The discount on machine, carriage and lag bolts is 5 per cent more than above for car lots. On hot-pressed and cold-punched nuts the discount is 25c. more per 100 lb. than quoted above for car lots.

Bolts and Nuts

(Quoted with actual freight allowed up to but not exceeding 50c. per 100 lb.)

	Per Cent Off List
Semi-finished hexagon nuts:	
⅞ in. and smaller, U. S. S.	80, 10 and 5
⅞ in. and larger, U. S. S.	75, 10 and 5
Small sizes, S. A. E.	80, 10, 10 and 5
S. A. E., ⅝ in. and larger	75, 10, 10 and 5
Stove bolts in packages	80, 10 and 5
Stove bolts in bulk	80, 10, 5 and 2½
Tire bolts	60 and 5

Semi-Finished Castellated and Slotted Nuts

(Actual freight allowed up to but not exceeding 50c. per 100 lb.)

(To jobbers and consumers in large quantities)

	Per 100 Net S.A.E.	Per 100 Net U.S.S.		Per 100 Net S.A.E.	Per 100 Net U.S.S.
½-in.	$0.44	$0.44	⅞-in.	$2.35	$2.40
⅝-in.	0.515	0.515	1-in.	3.60	3.60
¾-in.	0.62	0.64	1-in.	5.65	5.80
⅞-in.	0.79	0.90	1¼-in.	8.90	8.90
1-in.	1.01	1.05	1½-in.	12.60	13.10
1-in.	1.39	1.43	1¾-in.	18.55	18.35
1⅛-in.	1.70	1.73	1⅞-in.	21.00	21.00

Larger sizes.—Prices on application.

Large Rivets

	Base Per 100 Lb.
F.o.b. Pittsburgh	$2.50 to $2.60
F.o.b. Cleveland	2.70
F.o.b. Chicago	2.65 to 2.75

Small Rivets

	Per Cent Off List
F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70, 10 and 5 to 70 and 10
F.o.b. Chicago	70, 10 and 5 to 70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 60c. per 100 lb.)

	Per Cent Off List
Milled cap screws	50 and 10
Milled standard set screws, case hardened,	60 and 5
Milled headless set screws, cut thread	50
Upset hex. head cap screws, U. S. S. thread,	80, 10 and 10
Upset hex. cap screws, S.A.E. thread,	80, 10 and 10
Upset set screws	80, 10 and 5
Milled studs	70 and 5

Chicago

Another Gary Furnace Blown Out—Large Structural Projects Pending

CHICAGO, Aug. 17.—Steel mill blast furnace operations have been again reduced in this territory by the blowing out of a stack at the Gary works. This does not reflect a slackening in the demand for the general run of steel mill products, but is a result of the reduction in rail mill operations. The Steel Corporation stacks now in blast include nine at Gary, eight at South Chicago and one at Joliet, or 18 out of 27 in the district. The Inland Steel Co. continues to blow four stacks, the Wisconsin Steel Co. two and the Youngstown Sheet & Tube Co. two, making a total of 26 active steel works blast furnaces out of 36 in this section.

Consumption of steel so far in August continues at about the same rate as during the months of June and July, and in view of increased demand expected in the fall the trade is confident that 1926 will prove an exceptionally good year for the steel industry. This spring the railroads were not able to get rail shipments at the time desired, and this, coupled with the fact that railroad earnings are comparatively high, leads producers to believe that rail contracts this fall will be heavy and that shipments against these contracts will move forward in good volume before the winter months set in.

Pig Iron.—Shipments of Northern iron in this territory are equal in volume to those of the previous week and are averaging slightly better than during the first 14 days of July. Stocks in the hands of users are not heavy, and in many instances furnaces are being pressed for deliveries because the melt has run ahead of estimated requirements. Furnace stocks are about average for this time of the year and are reported as well balanced. Spot sales of Northern No. 2 are being made at $21, local furnace. The Allis-Chalmers Mfg. Co., West Allis, Wis., is in the market for 2000 tons of foundry and malleable iron, and a user in the Chicago territory wants 100 tons of 10 or 15 per cent silvery. Charcoal iron is in better demand, and a 200-ton and a 150-ton sale are reported at $29.04, delivered. A few small sales of low phosphorus iron have been made within the price range of $29.50 to $30, delivered.

Quotations on Northern foundry, high phosphorus and malleable iron are f.o.b. local furnace, and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards:

Northern No. 2 foundry, sil. 1.75 to 2.25	$21.00
Northern No. 1 foundry, sil. 2.25 to 2.75	21.50
Malleable, not over 2.25 sil.	21.00
High phosphorus	$21.00 to 21.50
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	29.04
Southern No. 2 (all rail)	27.01
Southern No. 2 (barge and rail)	25.18
Low phos., sil. 1 to 2 per cent, copper free	29.50 to 30.00
Silvery, sil. 8 per cent	32.29
Bessemer ferrosilicon, 14 to 15 per cent	45.79

Ferroalloys.—The demand for ferromanganese is light, and it is being quoted at $88, seaboard. Specifications for ferrosilicon are heavy, but no sales are reported. Foreign spiegeleisen is reaching the Chicago market and is being taken at $34 to $34.50, New Orleans, for the 18 to 22 per cent grade. The freight rate from New Orleans to Chicago is $7.56.

We quote 80 per cent ferromanganese, $95.56, delivered Chicago; 50 per cent ferrosilicon, $85, delivered; spiegeleisen, 18 to 22 per cent, $41.76, delivered Chicago.

Plates.—Demand for plates from builders of oil storage tanks is holding up unusually well, and mills this week have added to their books over 7000 tons of tankage material. Pending inquiry is large and is still several times the tonnage placed this week. Railroad car inquiry and buying are still lacking, but there is more disposition upon the part of some railroads to center their attention on rolling stock requirements. Mill prices on plates are firm at 2.10c., Chicago. Producers' efforts to obtain 2.25c. for lots of less than 100 tons each do not appear to have been successful.

The mill quotation on plates is 2.10c. per lb., base, Chicago.

Sheets.—Demand again shows improvement, and local producers are unwilling to quote less than six weeks' delivery. Users' stocks are low, and pressure for prompt shipment is insistent. The tonnage of sheets now moving in this territory is largely the result of spot buying, although here and there a user will contract for fourth quarter requirements. One order for 1500 tons calls for prompt delivery. Warehouses are taking a normal tonnage for this time of the year, but they are holding stocks close to actual requirements. Prices are steady and show greater strength than a week ago. Although there is some talk of a price advance, producers have not yet taken that step.

Chicago delivered prices from mill are 3.30c. for No. 28 black; 2.45c. for No. 10 blue annealed; 4.45c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Structural Material.—The outlook for the building industry in the Chicago district is exceptionally good, and it is estimated by the trade that not less than 35,000 tons of plates, shapes and bars will be required for large structures the plans for which are well under way. The Pittsfield Building, Chicago, will require 6500 tons, and fabricators estimate that the Mather Tower Building, which calls for 1800 tons of column material, will take a total of more than 3000 tons. Other local projects which will each require several thousand tons are the State Bank of Chicago, the Fur Exchange, the Cook County jail and an addition to the grandstand at the White Sox baseball park. Fabricators report that they are obtaining better prices than at any time this year. Shops capable of taking the larger contracts are now well booked for two to three months. A Chicago mill this week booked 3600 tons of bridge material for the 1927 program of the Great Northern Railway. Plain material is steady at 2.10c., Chicago. In the main, the effort of mills to get 2.25c. for orders for less than 100 tons each has not been successful.

The mill quotation on plain material is 2.10c. per lb. base, Chicago.

Bars.—Demand for billet steel bars is well maintained, and shipments are at the same rate as a week ago. Specifications are approximately equal to shipments. Mill prices are unchanged at 2.10c., Chicago, but the recent effort to establish a price of 2.25c. for lots of less than 100 tons does not appear to have been successful. The demand from makers of cold-drawn bars is particularly active, as is that from the automotive trade. Specifications from manufacturers of agricultural machinery show improvement. A substantial amount of inquiry has been received from users who are interested in their fourth quarter requirements, but producers have not as yet opened books for that period. Iron bars are in light demand. Specifications and shipments of rail steel bars are slightly heavier than during the first two weeks of July. New buying continues on a hand-to-mouth basis, with buyers carrying low stocks and demanding prompt shipments. Shipments on contracts to makers of agricultural machinery are in fair volume. Salesmen are actively soliciting fence post business and are meeting with fair success, considering that it is still early for fall buying to begin.

Mill prices per lb. are: Mild steel bars, 2.10c., base, Chicago; common bar iron, 2c., base, Chicago; rail steel bars, 2c., base, Chicago.

Cast Iron Pipe.—The demand continues in fair volume, and prices are gaining in strength. Quotations now range from $40.50 to $42, base Birmingham, for 6-in. and larger diameters. The freight rate to Chicago is $8.20. James B. Clow & Sons have booked 1000 tons of 6, 8, 10 and 12-in. Class B pipe for Lombard, Ill., at $42, base Birmingham. Lyons, Ill., is in the market for 400 tons of 6, 8 and 10-in., Class B pipe. The

awarding of 800 tons for Newark, Ohio, is being delayed for 10 days to two weeks. Milwaukee will receive bids Aug. 20 on 500 tons of 8-in. Class C. Although several large tonnages are in prospect in this territory, the general impression is that the heavy summer buying is about over and that from now on, until fall buying for spring delivery takes place, orders will be small and of such proportions as can be conveniently placed in the ground before cold weather sets in. Private buying is light. Deliveries for 6, 10 and 12-in. pipe average about six weeks.

We quote per net ton, delivered, Chicago, as follows: Water pipe, 4-in., $52.70 to $54.20; 6-in. and over, $48.70 to $50.20; Class A and gas pipe, $4 extra.

Rails and Track Supplies.—Buying is light, as is to be expected at this time of the year. Chicago mills booked 4000 tons of standard-section rails during the week and a small tonnage of track fastenings, all in miscellaneous lots. Steel tie plates are firm in this district at 2.35c., mill. The light rail market is quiet, with bookings totaling 500 tons.

Standard Bessemer and open-hearth rails, $43; light rails, rolled from billets, $36 to $38 per gross ton, f.o.b. maker's mill.

Standard railroad spikes, 2.90c. per lb. mill; track bolts with square nuts, 3.90c. mill; steel tie plates, 2.35c. mill; angle bars, 2.75c. mill.

Reinforcing Bars.—Competition is unusually keen on projects calling for the use of billet steel bars, and an award made this week for over 500 tons was taken at 2.25c., Chicago warehouse. Going prices for awards in excess of 50 tons each are within the range of 2.25c. to 2.40c., and individual sales averaging 10 tons each are reported at 2.60c. Fresh inquiries are numerous, and call for a large tonnage in the aggregate. The city of Chicago has a west side intercepting sewer in prospect which will require a heavy tonnage. Shipments from warehouses in August are expected to exceed those for July and are better than normal for this season. Recent awards and fresh inquiries are shown on page 527.

Cold-Rolled Strip.—Demand is holding steady and is emanating from practically all classes of users. Prices are stronger at 3.60c., Cleveland, or 3.90c. delivered Chicago.

Bolts, Nuts and Rivets.—Specifications are about equal in volume to those of a week ago, but August business is not averaging as well as it did in the same month a year ago. Specifications from builders of agricultural machinery are a little heavier, but makers do not expect a material improvement in business from that industry until after Sept. 1. Spot buying is light, and no interest is yet being shown in fourth quarter contracting, which is expected to get under way within the next two weeks. Bolt and nut makers are operating at close to 65 per cent of capacity.

Hot-Rolled Strip.—Demand is good, and prices are steady at 2.50c., Chicago, for all gages wider than 6 in. and at 2.60c. for the narrower material.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Mild steel bars	3.00c.
Reinforcing bars, billet steel	2.25c. to 2.60c.
Cold-finished steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Hoops	4.15c.
Bands	3.65c.
No. 28 black sheets	4.10c.
No. 10 blue annealed sheets	3.50c.
No. 28 galvanized sheets	5.25c.
Standard railroad spikes	3.55c.
Track bolts	4.55c.
Structural rivets	3.50c.
Boiler rivets	3.70c.
	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	47½
Coach or lag screws	55 and 5
Hot-pressed nuts, square, tapped or blank	3.25c. off per lb.
Hot-pressed nuts, hexagons, tapped or blank	3.75c. off per lb.
No. 8 black annealed wire, per 100 lb.	$3.30
Common wire nails, base, per keg	3.05
Cement coated nails, base, per keg	3.05

Wire Products.—Buying by the jobbing trade is holding up well. Sales are good to all parts of the country, with the exception of the Dakotas, where drouth has seriously affected the crops. Mills found it advisable earlier in the year to reduce stocks on hand but are now engaged in slowly building them up. Reported shading of prices by warehouses on coated nails is said to be due to an effort to rid stocks of a few odd lots of count kegs which were still on hand. Specifications are in good volume from the manufacturing trade, particularly from the makers of automobile parts and accessories. Producers of wire products report that both sales and shipments so far this year show a substantial gain as compared with the same period of 1925. Mills are operating at close to 60 per cent of capacity. Mill prices are shown on page 513.

Coke.—Spot buying of coke is more active, since some users who do not cover by contract are beginning to look forward to their early fall requirements. Shipments in this territory are heavy and are at the same rate as during July. Foundry coke prices remain at $9.75, ovens, or $10.25, delivered in the Chicago switching district.

Old Material.—The market as a whole is quiet, except for a little inquiry received late in the week. Consumer buying is light and there is very little trading among dealers. Cast iron borings are probably the most active grade on the list, and buyers are offering to take small tonnages at $11.50 per gross ton, delivered. A 500-ton lot of rolled steel car wheels was taken at $18 per gross ton, delivered. Dealers are having little or no difficulty in having shipments of railroad steel accepted at the mills, but miscellaneous steel scrap, shipped as heavy melting steel, is in many instances not acceptable and must be returned to the yards to be worked over. This condition is resulting in an accumulation of an off-grade of heavy melting steel in the yards. In an effort to dispose of this, dealers are talking of making an effort to ship it by water to Eastern markets. In various quarters this proposal is not being given support for the reason that it is not believed that Eastern mills will accept the grade which is available for shipment.

We quote delivered in consumers' yards, Chicago and vicinity, all freight and transfer charges paid for all items, except relaying rails, including angle bars to match, which are quoted f.o.b. dealers' yards:

Per Gross Ton	
Heavy melting steel	$14.00 to $14.50
Frogs, switches and guards, cut apart, and miscellaneous rails	16.00 to 16.50
Shoveling steel	14.00 to 14.50
Hydraulic compressed sheets	12.50 to 13.00
Drop forge flashings	9.50 to 10.00
Forged cast and rolled steel car wheels	18.00 to 18.50
Railroad tires, charging box size	18.50 to 19.00
Railroad leaf springs, cut apart	18.50 to 19.00
Steel couplers and knuckles	17.50 to 18.00
Coil springs	18.50 to 19.00
Low phos. punchings	17.00 to 17.50
Axle turnings, foundry grade	14.50 to 15.00
Axle turnings, blast fur. grade	12.50 to 13.00
Relaying rails, 56 to 60 lb.	25.50 to 26.50
Relaying rails, 65 lb. and heavier	26.00 to 31.00
Rerolling rails	17.00 to 17.50
Steel rails, less than 3 ft.	17.50 to 18.00
Iron rails	14.50 to 15.00
Cast iron borings	11.25 to 11.75
Short shoveling turnings	11.25 to 11.75
Machine shop turnings	7.25 to 7.75
Railroad malleable	17.75 to 18.25
Agricultural malleable	15.50 to 16.00
Angle bars, steel	16.25 to 16.75
Cast iron car wheels	16.00 to 16.50
Per Net Ton	
No. 1 machinery cast	17.00 to 17.50
No. 1 railroad cast	16.25 to 16.75
No. 1 agricultural cast	16.25 to 16.75
Stove plate	14.50 to 15.00
Grate bars	14.25 to 14.75
Brake shoes	13.75 to 14.25
Iron angle and splice bars	14.00 to 14.50
Iron arch bars and transoms	20.00 to 20.50
Iron car axles	24.00 to 24.50
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	12.50 to 13.00
No. 1 busheling	11.50 to 12.00
No. 2 busheling	7.50 to 8.00
Locomotive tires, smooth	17.00 to 17.50
Pipes and flues	10.00 to 10.50

Cleveland

Steel Bookings Equal Those of July—Consuming Industries Busier

CLEVELAND, Aug. 17.—The volume of specifications for finished steel continues good, and present indications are that tonnage entered in this territory during August will equal that booked in July. Metal-working industries in the Cleveland district are operating on an average somewhat better than in July. Drop forge plants generally are well filled with work, and it is stated that none are operating at less than 70 per cent of capacity. Automobile companies are ordering steel more liberally than recently, although this improvement does not appear to have extended to alloy steel.

Inquiries reached this market for 8000 tons of plates for riveted steel pipe water lines. One is from Providence, R. I., for 6000 tons and the other from Saginaw, Mich., for 2000 tons. Another inquiry is for 1200 to 1500 tons of plates for repair work on Lake boats. There is increased activity in the structural field, which is also true of reinforced building work.

Prices are holding firm at 2c., Pittsburgh, for steel bars and structural material and 1.90c. for plates. Talk of higher prices on wire products has been revived.

Pig Iron.—There is still a moderate amount of buying, consisting almost entirely of small lots by smaller consumers who did not cover during the recent buying movement. There is also some inquiry for fourth quarter contracts from foundries that had previously bought only for the third quarter. Sales of foundry and malleable iron by Cleveland interests during the week aggregated 15,000 tons. One producer has inquiries for 4000 to 5000 tons in lots up to 1500 tons. There is virtually no change in the price situation from a week ago. While there has been some talk of an advance to $20, furnace, in the Michigan and Indiana territories, the Lake furnace prices for those States is still $19.50, or 50c. a ton above the recent minimum. It is improbable that Lake furnaces serving Michigan and Indiana will advance their prices above $19.50 unless the Valley price stiffens. In Cleveland the market is firm at $19, base furnace, for local delivery. For outside shipment the range is from $18 to $18.50, furnace, with one producer holding to the higher price. In the Valley district $18, furnace, is still the more common price, although $17.50 has not disappeared. Furnaces that are asking $18.50 are able to take only an occasional carlot at that price. The Hanna Furnace Co. this week blew in its Dover furnace, Dover, Ohio, which has been shut down for three weeks for relining.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6.01 from Birmingham:

Basic, Valley furnace	$17.50
N'th'n No. 2 fdy., sil. 1.75 to 2.25	19.50
Southern fdy., sil. 1.75 to 2.25	27.01
Malleable	19.50
Ohio silvery, 8 per cent	30.52
Standard low phos., Valley furnace	27.50

Semi-Finished Steel.—Specifications show improvement, particularly for steel bars, and the McKinney Steel Co., which recently increased operations from eight to 10 open-hearth furnaces, expects shortly to start up additional furnaces. New orders are light. Prices are firm at $36, Cleveland or Youngstown, for sheet bars and $35 for slabs and large billets.

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and structural shapes	3.00c.
Mild steel bars	3.00c.
Cold-finished rounds and hexagons	3.90c.
Cold-finished flats and squares	4.40c.
Hoops and bands	3.65c.
No. 28 black sheets	3.81c. to 3.85c.
No. 10 blue annealed sheets	3.15c.
No. 28 galvanized sheets	4.70c. to 5.00c.
No. 9 annealed wire, per 100 lb	$3.00
No. 9 galvanized wire, per 100 lb	3.45
Common wire nails, base, per keg	3.00

Alloy Steel.—Orders from the automotive industry are largely of a hand-to-mouth character, as some of the motor car builders are buying sparingly until they determine the market demand for their new models. Prices are holding to the recent range.

Warehouse Business.—Orders show some gain over last month both in number and size. Prices are firm except on sheets, on which there is still some irregularity.

Sheets.—The volume of business is holding up well, and there is an increased demand from the metal furniture and barrel manufacturers. Some of the mills that are comfortably filled are taking a firmer stand on prices. However, the bulk of the business is going at the quotations that have generally prevailed the past week or two. Black sheets can still be bought at 3.05c., Pittsburgh, although the more common range is 3.10c. to 3.15c. Most of the mills are on a 2.30c. base for blue annealed sheets, although 2.25c. is still being quoted. Galvanized sheets are not so firm as the other grades. These are plentiful at 4.25c. and can still be bought at 4.20c., although one or two independent producers have advanced their prices to 4.40c.

Cold-Rolled Strip.—There has been considerable buying recently by the automotive industry, and mills have more tonnage on their books than for several months. With the increased demand, prices are firmer and it is claimed that quotations below 3.50c., Cleveland, have disappeared. Tube stock is holding at 3.35c.

Reinforcing Bars.—The Pollak Steel Co. has taken 1000 tons for factory additions for the Oakland Motor Car Co., Pontiac, Mich., and the Bourne-Fuller Co. has booked 500 tons for a building for the Willard Storage Battery Co., Cleveland. Inquiry has improved, and the price situation on billet steel bars is firmer than recently, although on round lots 1.90c., Pittsburgh, probably can still be done. Rail steel bars are unchanged at 1.80c., mill.

Old Material.—A Valley district mill during the week made a few small-lot purchases of compressed sheet steel and No. 2 heavy melting steel. Some of both grades was bought at $16.75, but there are unconfirmed reports that as high as $17 was paid. No other purchases of any size by consumers are reported. Local dealers having short orders with Cleveland mills are finding it increasingly difficult to buy scrap at prices that have prevailed recently, and quotations have advanced about 50c. a ton on heavy melting steel, machine shop turnings and low phosphorus scrap and 25c. a ton on borings and turnings. Dealers are offering as high as $15.50 for heavy melting steel.

We quote per gross ton delivered consumers' yards in Cleveland:

Heavy melting steel	$15.00 to $15.50
Rails for rolling	16.25 to 16.50
Rails under 3 ft.	17.50 to 18.00
Low phosphorus billet, bloom and slab crops	19.00 to 19.50
Low phosphorus sheet bar crops	18.50 to 19.00
Low phosphorus plate scrap	18.50 to 19.00
Low phosphorus forging crops	16.75 to 17.25
Cast iron borings	12.00 to 12.25
Machine shop turnings	11.00 to 11.50
Mixed borings and short turnings	12.00 to 12.25
Compressed sheet steel	13.00 to 13.25
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	13.75 to 14.25
Railroad malleable	18.00 to 18.50
Light bundled sheet stampings	11.25 to 11.75
Steel axle turnings	12.50 to 13.00
No. 1 cast	16.50 to 17.00
No. 1 busheling	12.00 to 12.50
No. 2 busheling	12.00 to 12.25
Drop forge flashings, 15 in. and under	11.50 to 12.00
Railroad grate bars	12.50 to 13.00
Stove plate	12.50 to 13.00
Pipes and flues	10.00 to 10.50

Bolts, Nuts and Rivets.—Demand for bolts and nuts is unusually good for this season, and some of the manufacturers expect their business this month will be larger than during July. The market is firm. Large rivets are in fair demand, and the price of $2.60 per 100 lb. is being maintained by the leading local producer. Some of the makers of small rivets, which have been irregular, are taking a firmer price stand and are now holding to a minimum of 70, 10 and 5 per cent discount. Some large lots of small rivets have recently sold at 70, 10 and 10 per cent off list.

Coke.—While the market on beehive coke shows a firmer tendency, as some producers are stocking fuel, prices on Connellsville foundry coke are unchanged at $4 to $5, ovens. Foundry heating coke is a little firmer, ranging from $3 to $3.25. By-product coke for domestic use is quiet, with prices unchanged at $4.75 to $5, ovens, for nut and $5.50 for egg. Ohio by-product foundry coke is $7.50, ovens, for August.

New York

Buy 4700 Tons of Belgian Bars for Conowingo Dam—Heavier Pig Iron Sales

NEW YORK, Aug. 17.—Pig iron sales by local brokers have shown a gain, totaling approximately 13,000 tons for the past week. Most of this tonnage was placed with domestic furnaces. The Standard Gas Equipment Corporation, New York, however, is reported to have bought 500 tons of Continental foundry iron for its Baltimore plant, while it placed the remaining 500 tons of its inquiry for delivery at Greenville, N. J., with a domestic furnace. The Worthington Pump & Machinery Corporation, which was in the market for a total of 2280 tons of various grades for its plants at Harrison, N. J., East Cambridge, Mass., Holyoke, Mass., Elmwood Place, Ohio, and Buffalo, has closed for all its inquiries except 120 tons for Holyoke. For Harrison about 1000 tons of domestic iron was bought, as well as a small tonnage of foreign material. The Foran Foundry & Mfg. Co., Flemington, N. J., has closed for 1000 tons of eastern Pennsylvania iron. The Eastern Malleable Iron Co., Naugatuck, Conn., is reported to have bought against its inquiry for 2000 to 3000 tons of malleable. Abendroth Brothers, Port Chester, N. Y., are still in the market for 2000 tons of foundry, but otherwise there are few sizable inquiries pending. Prices on domestic iron are substantially unchanged, although somewhat steadier than heretofore. A New York State furnace which has been an important factor in this market has accumulated a comfortable backlog, but several other producers are still pressing to book additional business. Recent advances to importers of German foundry iron have been reflected in higher quotations to American melters. The minimum going price now appears to be $21, base, duty paid port of entry, or about $1 higher than recently.

We quote per gross ton delivered in the New York district as follows, having added to furnace prices $2.52 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.54 from Virginia:

East Pa. No. 2 fdy., sil. 1.75 to 2.25	$21.89 to $23.02
East Pa. No. 2X fdy., sil. 2.25 to 2.75	22.39 to 23.52
East Pa. No. 1X fdy., sil. 2.75 to 3.25	22.89 to 24.02
Buffalo fdy., sil. 1.75 to 2.25 (all rail)	22.91 to 23.91
No. 2 plain fdy., sil. 1.75 to 2.25 (by barge, del'd alongside in lighterage limits, N. Y. and Brooklyn)	20.00 to 21.00
No. 2 Virginia fdy., sil. 1.75 to 2.25	27.54 to 28.04

Warehouse Business.—Although the market for steel from stocks is reflecting the usual midsummer dullness, the total volume of current business is reported larger than is generally expected at this season. Following the recent upward revision of sheet prices to 4.50c. per lb. and 5.50c. per lb., base, for black and galvanized respectively, the market is showing considerable firmness. Most jobbers are still offering the 25c. per 100 lb. reduction for lots of 50 bundles, or more, but in some instances an effort is beng made to maintain the full quoted price on all business regardless of tonnage. A fair demand for bars and shapes is reported, but there are occasional complaints that imported steel is a serious competitor at $2 per ton and more under the current market for domestic material from warehouse stocks.

Reinforcing Bars.—Awards continue to be light, the only important jobs let during the week being warehouses for the Lincoln Safe Deposit Co. in New York and East Orange, N. J., which will take 1000 and 150 tons respectively. Inquiries continue to accumulate, with the prospect of a number of large tonnages being placed in the early fall. A warehouse in Jersey City will take 2500 tons, and a building for the American Book Bindery in New York, 600 tons. Mill prices are steady at 2.10c. per lb., base Pittsburgh, for small lots and 2c. for lots of 100 tons or over. The New York warehouse price continues at 3.15c., delivered at job, while Youngstown warehouses quote 2.50c. or 2.87c., delivered New York.

Finished Steel.—While August buying of steel products lacks the "snap" of earlier months of the year, the volume of orders continues to balance shipments, though the latter have fallen off somewhat in the past week, due to the effect of extreme heat and humidity on finishing mill output. Aside from the placing of 6500 tons of concrete reinforcing bars by Stone & Webster, Inc., for the Conowingo dam of the Susquehanna Power Co. near Havre de Grace, Md., there has been no outstanding tonnage in the week. About 4700 tons of these bars were bought from the Société Anonyme D'Ougrée-Marihaye, of Belgium, through its agents, A. Johnson & Co., New York, at a reported

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.24c.
Soft steel bars and small shapes	3.24c.
Iron bars	3.24c.
Iron bars, Swedish charcoal	7.00c. to 7.25c.
Cold-finished steel shafting and screw stock—	
Rounds and hexagons	4.00c.
Flats and squares	4.50c.
Cold-rolled strip, soft and quarter hard	6.25c.
Hoops	4.49c.
Bands	3.99c.
Blue annealed sheets (No. 10 gage)	3.89c.
Long terne sheets (No. 28 gage)	6.35c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galvanized annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ⅛ in. and larger	2.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

	Per Cent Off List
Machine bolts, cut thread	40 and 10
Carriage bolts, cut thread	30 and 10
Coach screws	40 and 10

Boiler Tubes—	Per 100 Ft.
Lap welded steel, 2-in.	$17.32
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
⅛-in. butt	46	29
¼-in. butt	51	37
⅜-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
⅛-in. butt	4	+19
¼-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100-lb. base box	$6.45	$6.20
Charcoal, per box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass†

	Per Lb.
Nos. 18 to 20	4.30c.
Nos. 22 and 24	4.35c.
No. 26	4.40c.
No. 28*	4.50c.
No. 30	4.70c.

Sheets, Galvanized†

	Per Lb.
No. 14	4.60c.
No. 16	4.75c.
Nos. 18 and 20	4.90c.
Nos. 22 and 24	5.05c.
No. 26	5.20c.
No. 28*	5.50c.
No. 30	6.00c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.
†Lots of 50 bundles 25c. per 100 lb. less.

price of 1.75c. per lb., c.i.f., duty paid. The remainder of the tonnage was divided among American mills. The difference between the foreign and domestic price was probably about $12 a net ton. Domestic steel prices, with the exception of those on cold rolled strip steel, are steady. Some makers of plates, shapes and bars now advance the opinion that there will be no advance in prices for fourth quarter. If the current quotation of 2c., Pittsburgh, on structural shapes and bars carries over into the last quarter the mills will have a better return on these products, as a considerable part of the shipments in this quarter apply on contracts made when the price was 1.90c. The firmer position taken by some mills on sheet prices a week ago has exerted a strengthening effect on the whole sheet market and quotations on black sheets below 3.10c., Pittsburgh, seem to have disappeared, while blue annealed and galvanized sheets are now well held at 2.30c. and 4.30c., Pittsburgh, respectively. Increased backlogs, the cutting down of sheet mill output due to hot weather, and the pressure for shipments of tin plate have combined to strengthen the sheet market. Some companies making both tin plate and sheets have had such urgent requests to rush shipments of tin plate that they have diverted steel from sheet mills to tin mills. Tin mill black is now reported to be firm at 3.15c., Pittsburgh. Cold rolled strip steel continues to show weakness, sales having been made at 3.35c. and 3.40c., Pittsburgh, while tube stock is being sold at 3.25c. In two of the lines of major consumption of heavy steel products—building construction and car building—there is a downward trend. A falling off in building in the New York district is indicated by the declining volume of construction permits and there are fewer inquiries for structural steel. Car building is at an extremely low point, but the car builders derive encouragement from reported plans of the railroads to rehabilitate their rolling stock. Tangible developments in the form of inquiries for cars and locomotives are still lacking, however, but the car-building trade points to the fact that the supply of surplus cars is the lowest in several years.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c. per lb.; plates, 2.24c.; structural shapes, 2.24c. to 2.34c.; bar iron, 2.24c.

Cast Iron Pipe.—Although there are no large tonnages of bell and spigot pipe under inquiry, with the exception of the 10,000 tons on which the Department of Purchase, New York, opens bids this week, buying of small lots to complete current contracts brings the total business to a satisfactory size. The J. G. White Engineering Corporation, 43 Exchange Place, New York, awarded the 750 to 1500 tons of 6, 8, 10 and 12-in. pipe for Far Rockaway, L. I., to the United States Cast Iron Pipe & Foundry Co. Among the small tonnages at present before the market is 200 to 300 tons of water pipe for installation in a dam at Kingston, N. Y.

We quote pressure pipe per net ton, f.o.b. New York in carload lots, as follows: 6-in. and larger, $50.60 to $52.60; 4-in. and 5-in., $55.60 to $57.60; 3-in., $65.60 to $67.60; with $5 additional for Class A and gas pipe.

Coke.—Foundry grade continues quiet at $4 to $5 per ton, Connellsville, but an increasing demand for furnace coke is reported, with prices showing more firmness at $3.25 to $3.50 per ton. Delivered prices of Connellsville foundry are $7.91 to $8.91, Newark and Jersey City, N. J.; $8.03 to $9.03, northern New Jersey, and $8.79 to $9.79, New York or Brooklyn. By-product foundry coke ranges from $9.59 to $10.77 per ton, delivered Newark or Jersey City.

Old Material.—Stimulated by the activity of brokers and an absence of large supplies of scrap, the market on all grades continues to move upward. Heavy melting steel is being purchased by brokers at from $15.50 per ton, delivered, on a low freight rate into eastern Pennsylvania, to $17 and occasionally $17.25 per ton, on freight rates up to $3.78. In many cases brokers are paying the full price of their contracts to complete orders. Machine shop turnings, borings and turnings and bundled skeleton are being purchased at $14 and slightly higher prices, delivered to eastern Pennsylvania consumers. Specification pipe brings $16 per ton, delivered Lebanon, Pa. Stove plate, delivered eastern Pennsylvania, brings up to $14.50 per ton, with only moderate tonnages obtainable at this price. No. 1 heavy breakable cast continues at $16.75 per ton, delivered Harrisburg, Pa., and at $17 per ton, delivered Florence, N. J., the latter shipment being for a selected grade. Two railroad lists, which closed in the past week, are understood to have brought slightly higher than current buying prices for delivery to eastern Pennsylvania.

Buying prices per gross ton, New York, follow:

Heavy melting steel (yard)	$11.00 to $11.50
Heavy melting steel (railroad or equivalent)	12.85 to 13.50
Rails for rolling	14.00 to 14.25
Steel car axles	20.00 to 20.50
Iron car axles	24.00 to 24.50
No. 1 railroad wrought	14.50 to 15.00
Forge fire	10.50 to 11.00
No. 1 yard wrought, long	13.25 to 13.75
Cast borings (steel mill)	10.50 to 11.00
Cast borings (chemical)	13.00 to 13.50
Machine shop turnings	10.50 to 11.00
Mixed borings and turnings	10.50 to 11.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	11.75 to 12.25
Stove plate (steel mill)	11.00 to 11.50
Stove plate (foundry)	11.50 to 12.00
Locomotive grate bars	11.00 to 11.50
Malleable cast (railroad)	16.50 to 17.00
Cast iron car wheels	13.50 to 14.00
No. 1 heavy breakable cast	12.75 to 14.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$16.50 to $17.00
No. 1 heavy cast (column, building material, etc.), cupola size	15.00 to 15.50
No. 2 cast (radiators, cast boilers, etc.)	14.00 to 14.50

Philadelphia

Small-Lot Purchases Sustain Mill Operations—Scrap Strong

PHILADELPHIA, Aug. 17.—Maintaining its even stride, the iron and steel market in this district reflects a situation that is especially satisfactory for this season of the year. Prices are holding, and production and shipments are well balanced. No large tonnages of any character are coming to furnaces and mills, and while there has been a lull the past week in the pig iron trade, steel tonnages are being booked in moderate individual lots which, when aggregated, make it possible to continue operations at the rate that has been prevailing for the past six weeks.

The lag in the pig iron market is looked upon as a natural reaction from the recent flurry in purchases. The price of $21, base furnace, on foundry iron remains unchanged, although some makers are showing a slightly firmer attitude. A little fourth quarter business has been done at this figure.

Scrap continues to gain strength, but heavy breakable cast is the only grade that has advanced. It is the belief of dealers, however, that the next actual transactions on heavy melting steel and other grades will involve higher quotations than those now existing.

Pig Iron.—Transactions in pig iron the past week have been small. The market is expected to gather momentum as the result of business which is said to be about to develop. The price of No. 2 plain continues to hold at $21, furnace, with some makers taking a stronger position, as indicated by the fact that they are less inclined to equalize freight differentials. There has been a small amount of fourth quarter business taken at the ruling prices. It is reported that German iron has been advanced 75c. a ton, which, with a prior advance of 25c., brings the price of the foreign product virtually up to the level of domestic iron. Sales of 1000 tons of miscellaneous foundry grades were made during the past week by one producer in this district. The same furnace also sold a fair tonnage of copper bearing low phosphorus iron, including one lot of 500 tons, another of 300 tons and a third of 150 tons, at $23 after equalizing the freight. Inquiries for last

quarter shipment are coming out slowly, some of them evidently for the purpose of sounding the market. Basic iron is in only moderate demand, with the price remaining at $21 to $21.50, delivered. The Pennsylvania Railroad has closed on its inquiry for 300 to 500 tons of No. 2X and special car wheel iron. The Midvale Co. has not as yet closed on its inquiry for 1000 to 1500 tons of No. 2 plain iron.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to $1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$21.76 to $22.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	22.26 to 22.76
East. Pa. No. 1X	22.76 to 23.26
Virginia No. 2 plain, 1.75 to 2.25 sil.	27.67 to 28.67
Virginia No. 2X, 2.25 to 2.75 sil.	28.17 to 29.17
Basic delivered eastern Pa.	21.00 to 21.50
Gray forge	21.50 to 22.00
Malleable	22.00 to 22.50
Standard low phos. (f.o.b. furnace)	22.00 to 23.00
Copper bearing low phos. (f.o.b. furnace)	23.50 to 24.00

Plates.—Consumers are showing increased interest in fourth quarter requirements and have put out inquiries, but no business for that delivery has been closed. Reports of a possible advance to 2c. for fourth quarter apparently have been responsible for some of these inquiries. The current price of 1.90c., base Pittsburgh, is reported to be firmly held. One consumer is understood to have gone carefully over the market looking for a concession, but is reported to have been unable to get it.

Structural Shapes.—Mills are receiving small lots of shapes from miscellaneous sources and are taking business at 2c., base Pittsburgh. The market has gathered a little strength, and with fabricators getting considerable work it promises at least to maintain its position, in view of the backlog that has been built up. Occasionally 2.10c. is being paid for quick delivery and small tonnages.

Billets.—Dullness continues to prevail in the market for semi-finished steel. Prices remain unchanged at $35 base Pittsburgh for rerolling steel, and $40, base Pittsburgh, for forging billets.

Hot-Rolled Strips.—Hot-rolled strip steel is fairly firm in price at 2.30c., Pittsburgh, for sizes 6 in. and over and at 2.50c., Pittsburgh, for sizes less than 6 in. wide. The tendency is toward added strength.

Cold-Rolled Strips.—While orders for cold-rolled strip steel are coming to makers in fair volume, the price position is rather weak. Quotations range from 3.60c. to 3.75c., Pittsburgh, but it is said that concessions can be had on a sizable tonnage, though this depends somewhat on the extras.

Sheets.—Black sheets are frequently quoted at 3.15c., base Pittsburgh, but business still can be done at 3.10c. Galvanized sheets are showing somewhat more strength at 4.20c. to 4.30c., base Pittsburgh. Concessions still are obtainable in blue annealed sheets, though the market shows a stronger tone and is generally quoted at 2.30c., Pittsburgh.

Bars.—Demand for steel bars has shown slight improvement during the past week, but is not large. The price is holding at 2c., base Pittsburgh. The market for bar iron is quiet and is quoted at 2.22c., Philadelphia.

Ferroalloys.—Orders for ferromanganese involve only small lots. The domestic price remains unchanged at $88 to $95, furnace, for the standard grade.

Warehouse Business.—Jobbers report that business is dull. Prices are unchanged. The most active demand is for corrugated galvanized sheets.

Imports.—Germany continues to lead in shipments of pig iron to Philadelphia. Of 2543 tons received here last week, 1350 tons came from Germany, 1043 tons from India and 150 tons from the Netherlands. Other imports were as follows: Iron ore from Algeria, 7500 tons; iron ore from Sweden, 7884 tons; iron ore from Germany, 549 tons; structural steel from Belgium, 127 tons; scrap from Belgium, 83 tons; wire rods from Sweden, 5 tons; scrap brass from Canada, 22 tons.

Old Material.—Transactions the past week have been few, but the market continues to grow stronger. In the absence of dealers the range on heavy melting steel stands at $16 to $17, delivered, but brokers say that this grade cannot be bought at less than $17.50 and possibly $18. Brokers have had to pay as high as $17 to cover contracts, some taking losses as high as $1.50 a ton. The only increase in price the past week has been in heavy breakable cast for steel works, which moved up 50c. a ton to $17.50. Grades other than heavy melting steel and heavy breakable cast which show particular strength are couplers and knuckles, wrought iron pipe, rolled steel wheels and railroad grate bars. At the same time some mills continue to resist increases and are staying out of the market as long as they may safely do so.

We quote for delivery, consuming points in this district, as follows:

No. 1 heavy melting steel	$16.00 to $17.00
Scrap rails	16.00 to 17.00
Steel rails for rolling	17.50 to 18.00
No. 1 low phos., heavy, 0.04 per cent and under	21.00 to 22.00
Couplers and knuckles	19.00 to 19.50
Rolled steel wheels	19.00 to 19.50
Cast iron car wheels	17.50 to 18.00
No. 1 railroad wrought	18.00 to 18.50
No. 1 forge fire	14.50
Bundled sheets (for steel works)	14.00
Mixed borings and turnings (for blast furnace)	13.50 to 14.50
Machine shop turnings (for steel works)	14.00
Machine shop turnings (for rolling mills)	14.00 to 14.50
Heavy axle turnings (or equivalent)	15.00 to 15.50
Cast borings (for steel works and rolling mill)	14.00 to 14.25
Cast borings (for chemical plant)	15.00 to 15.50
No. 1 cast	17.50 to 18.50
Heavy breakable cast (for steel works)	17.50
Railroad grate bars	15.00
Stove plate (for steel works)	15.00
Wrought iron and soft steel pipes and tubes (new specifications)	15.50 to 16.00
Shafting	21.00 to 22.00
Steel axles	23.00 to 24.00

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Tank steel plates, ¾-in. and heavier	2.80c. to 3.00c.
Tank steel plates, ¼-in.	3.00c.
Structural shapes	2.75c. to 2.90c.
Soft steel bars, small shapes and iron bars (except bands)	3.00c.
Round-edge iron	3.50c.
Round-edge steel, iron finished, 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforced steel bars, square, twisted and deformed	3.00c.
Cold-finished steel, rounds and hexagons	4.00c.
Cold-finished steel, squares and flats	4.50c.
Steel hoops	4.00c. to 4.25c.
Steel bands, No. 12 gage to ¼-in., inclusive	3.75c. to 3.90c.
Spring steel	5.00c.
No. 28 black sheets	4.35c.
No. 10 blue annealed sheets	3.40c.
No. 28 galvanized sheets	5.55c.
Diamond pattern floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
½-in.	5.20c.
Rails	3.50c.
Tool steel	6.00c. to 6.50c.
Swedish iron bars	

The enormous increase in registered trademarks during the past 25 years, particularly in the last decade, strikingly reflects the increasing importance of the marketing and distribution problem in our national economy, as well as revolutionary changes in our traditional channels of trade, according to a comparative study of trademarks and patents issued in the United States, made by the National Industrial Conference Board, 247 Park Avenue, New York. While 46,450 patents were issued in 1925, or 88 per cent more than had been issued in the year 1900, the number of trademarks issued in 1925 shows an increase of more than 800 per cent over that of 1900, amounting to 16,118 and 1721 respectively.

San Francisco

Shipment of 1250 Tons of German Steel Arrives—Domestic Bars Weaker

SAN FRANCISCO, Aug. 14 (*By Air Mail*).—From the viewpoint of the Pacific Coast buyer of iron and steel two factors at present overshadow all others. The first and most significant of these is the growing tonnage of foreign iron and steel coming in at Pacific Coast ports, and the second is the probability of lower ocean freight rates on steel, applying on water shipments to California from Atlantic ports via the Panama Canal.

During the week about 1250 tons of steel and 720 kegs of wire nails came in from Germany. This shipment included 500 tons of soft steel and 400 tons of reinforcing bars, 300 tons of shapes, and about 50 tons of checkered floor plates. Foreign reinforcing bars are being quoted at about 1.60c. to 1.80c., duty paid, and about 1.75c. to 1.80c. is being asked for foreign shapes. Imported nails have been quoted recently as low as $3.10. Because of the low prices being named on foreign reinforcing bars, out-of-stock quotations on domestic bars in San Francisco have weakened. Neither local nor Eastern mills, however, have yet changed their quotations.

In regard to ocean freight rates on steel from Atlantic ports to the Pacific Coast some of the steamship companies are considering the advisability of putting into effect a rate of 20c. per 100 lb. If this should be done, it would be equivalent to a freight rate reduction of $2 a ton. The so-called conference lines have been quoting 30c., and the non-conference carriers have been asking from 22.05c. to 25c. Because of the uncertainty in regard to what the steamship companies will do, local buyers are hesitating about placing orders with Eastern mills. This is said to account, to some extent, for the relatively small amount of buying that has been done during the week.

Pig Iron.—Quotations on German foundry iron have been advanced 75c. a ton, and the asking price now is about $24.25, duty paid, f.o.b. cars San Francisco. In connection with the growing importation of foreign iron it is understood that during the first half of this year a local importer sold 18,000 tons of German and Indian foundry irons in the San Francisco and Los Angeles districts. Business during the week has been confined to routine developments.

*Utah basic	$25.00 to $26.00
*Utah foundry, sil. 2.75 to 3.25	25.00 to 26.00
**English foundry, sil. 2.75 to 3.25	25.00
**Indian foundry, sil. 2.75 to 3.25	25.00
**German foundry, sil. 2.75 to 3.25	23.00 to 23.50
**Dutch foundry, sil. 2.75 to 3.25	22.50
**Belgium foundry, sil. 2.75 to 3.25	22.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Shapes.—Lettings during the week total 2905 tons; fresh inquiries call for 3450 tons. The largest individual job, 2000 tons, for the McCarty Hotel, Beverly Hills, Cal., was taken by the Llewellyn Iron Works, Los Angeles. The Great Western Power Co., San Francisco, is in the market for 1000 tons for transmission towers. Eastern mills continue to quote plain material at 2.35c., c.i.f. Coast ports.

Plates.—No lettings of importance, and no fresh inquiries calling for over 100 tons of steel have come out during the week. A number of small jobs are being figured, however, and fabricators are fairly busy. Eastern mills continue to quote plates at 2.30c., c.i.f. Coast ports.

Bars.—Low prices being quoted on foreign reinforcing bars have weakened out-of-stock quotations on domestic bars in San Francisco. Local concrete bar jobbers are now asking about 20c. per 100 lb. less than they were one week ago. Reinforcing bar lettings during the week exceed 2000 tons, and several fresh inquiries have come into the market. Local jobbers are now quoting reinforcing bars as follows: 2.60c. to 2.65c., base per lb. on lots of 250 tons; 2.75c. to 2.80c., base per lb. on carload lots, and 3c. to 3.05c., base, on less-than-carload lots.

Cast Iron Pipe.—Redwood City, Cal., has placed 143 tons of 4 and 6-in. Class B cast iron pipe with the Grinnell Co. of the Pacific, and Eureka, Cal., has awarded about 119 tons of 8-in. Class B pipe to the McWane Cast Iron Pipe Co. The Weyerhauser Timber Co., Tacoma, Wash., has placed 125 tons of 4, 6 and 8-in. Class B cast iron pipe with the Central Foundry Co., San Francisco, for shipment to a Weyerhauser subsidiary company in Newark, N. J. San Francisco will close bids Sept. 9 on 485 tons of 8, 12 and 16-in. Class B pipe.

Warehouse Business.—While buyers are not anticipating their forward requirements to any marked extent, the amount of business being done at present is fairly substantial in the aggregate for this time of the year. Prices are unchanged.

Sheets.—The Kittle Mfg. Co., Los Angeles, has been awarded a contract for 1,500,000 pairs of motor vehicle license plates by the State Board of Control. The 700 tons of black sheets that will be required by the Kittle company for this work is expected to be placed with a local mill. Galvanized sheets are quoted at 4.20c. to 4.30c., base Pittsburgh, blue annealed sheets at 2.25c. to 2.30c., base, and black sheets at 3.10c. to 3.15c., base.

Coke.—Buyers are fairly well covered, and comparatively little fresh business of importance has developed during the week. Local importers are quoting German by-product coke at about $12 to $12.50 per net ton at incoming dock.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and structural shapes	3.30c.
Mild steel bars and small angles	3.30c.
Small channels and tees, ¾-in to 2¾-in.	3.90c.
Spring steel, ¾-in. and thicker	7.00c.
No. 28 black sheets	4.90c.
No. 10 blue annealed sheets	3.90c.
No. 28 galvanized sheets	6.00c.
Common wire nails, base per keg	$3.75
Cement coated nails, base per keg	3.00

Birmingham

Heavy Water Shipments of Steel and Pipe—Scrap Still Quiet

BIRMINGHAM, Aug. 17.—With sales of small lots adding to bookings in hand, the production of foundry pig iron is expected to be maintained in its present volume. One furnace on foundry iron will be blown out shortly, but its place will be taken by a sister furnace. Prices are unchanged at $21, Birmingham, for No. 2 foundry. One producer sold an average of 750 tons of pig iron daily during the past week, although its output was considerably more. Relatively little iron has been piled on furnace yards, however. Further inquiries for fourth quarter iron have appeared, and a buying movement for that delivery is expected to get under way soon. Since several of the larger melters are unable to keep ahead of the demand for their products, generous purchases of pig iron seem assured. The consumption of basic iron in this district is unusually steady.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil	$21.00
No. 1 foundry, 2.25 to 2.75 sil	21.50
Basic	21.00
Charcoal, warm blast	30.00

Rolled Steel.—Reflecting the activity of the steel market in this district, the Warrior River barge service, operated by the Government, this week put on an extra tow of five barges of rails and two barges of wire, nails, cotton ties and reinforcing bars, the rails being for export through Mobile and the other products being for distribution at New Orleans. Being short of barges and tow boats, the barge service was able to take only 4000 tons of rails for export out of 6500 tons scheduled to leave Mobile by Sept. 6. The barge service is booking shipments many weeks ahead. Sales in the Texas market are increasing, and local consumption of steel is also heavy. Demand for both plates and

structural shapes is active, and there is a revival of interest in sheets. The Gulf States Steel Co. is ready to light its open-hearth furnaces, which have been repaired, but its idle blast furnace will be out for another month. Soft steel bars and structural shapes continue to hold at 2.15c. to 2.25c., base Birmingham, while tank plates range from 2.05c. to 2.15c.

Cast Iron Pipe.—All pressure pipe shops in this State are operating at capacity, with heavy specifications in hand and further business in sight. The United States Cast Iron Pipe & Foundry Co. is shipping 4000 tons of pipe by water to Miami, Fla., 1000 tons at a time. The pipe is moving via the Warrior River to Mobile and from there by the Waterman Steamship Line to Miami. Pipe output is expanding as the operations of new shops increase. Prices remain unchanged at $40 to $41, Birmingham, for 6-in. and larger diameters.

Coke.—With the exception of less than 25 ovens, all of the by-product capacity in this State is in operation. Independent producers are finding a ready outlet for their production, but iron and steel companies are still carrying some coke in stock for future needs. Few beehive ovens in this State are active. Foundry coke continues to range from $5.50 to $6 per net ton, Birmingham.

Rails.—With the addition of 16,000 tons of 100-lb. rails placed recently with the Tennessee Coal, Iron & Railroad Co., 107,400 tons of rails have been purchased by the Southern Railway System during the year. More than 80,000 tons of the total will be rolled at Ensley, Ala.

Old Material.—With the larger consumers refraining from buying, demand for heavy melting steel is practically at a standstill. There have been some sales of cast scrap, but the tonnage involved is negligible. Deliveries of cast against contracts, however, are in good volume. The increased activity reported from other market centers has not yet affected the local situation, but dealers are keeping their yards well stocked.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical	$15.00 to $16.00
Heavy melting steel	12.00 to 13.00
Railroad wrought	12.00 to 13.00
Steel axles	17.00 to 18.00
Iron axles	17.00 to 18.00
Steel rails	13.00 to 14.00
No. 1 cast	16.50 to 17.00
Tramcar wheels	16.00 to 17.00
Car wheels	16.00 to 16.50
Stove plate	14.00 to 14.50
Machine shop turnings	7.50 to 8.00
Cast iron borings	7.50 to 8.00
Rails for rolling	15.00 to 16.00

Boston

Pig Iron Demand Tapers—Concrete Bars Weak—Scrap Stronger

BOSTON, Aug. 17.—Pig iron sales the past week totaled approximately 7000 tons, most of which was booked by New York State furnaces and the Mystic Iron Works. Substantial tonnages of No. 2X and No. 1X iron were placed with machinery makers at prices 50c. to $1 a ton, delivered, under the best Buffalo furnaces can do. Buffalo and western Pennsylvania furnaces have picked up a little business, however, at full asking prices. These irons are bought mainly for mixture purposes. One New York State furnace, having secured a substantial backlog, is endeavoring to secure slightly higher prices, but another, as well as the Mystic Iron Works, is still competing actively for large and small tonnages. It is practically assured the Everett, Mass., furnace will blow in the first week of September. A heater manufacturer has yet to cover for fourth quarter, and a textile machinery maker is dickering on a round tonnage for late 1926 delivery. It is becoming apparent, however, that the buying movement in New England is drawing to a close and that practically all large and a majority of small melters are covered for the remainder of 1926, unless there is a pronounced increase in the demand for castings, which at the moment seems doubtful. A majority of New England foundries today are operating only three or four days a week.

We quote delivered prices on the basis of the latest sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia, and $9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25	$24.15 to $24.65
East. Penn., sil. 2.25 to 2.75	24.65 to 25.15
Buffalo, sil 1.75 to 2.25	22.91 to 23.91
Buffalo, sil. 2.25 to 2.75	23.41 to 24.41
Virginia, sil. 1.75 to 2.25	27.92 to 28.42
Virginia, sil. 2.25 to 2.75	28.42 to 28.92
Alabama, sil. 1.75 to 2.25	30.60
Alabama, sil. 2.25 to 2.75	31.10

Finished Material.—Concessions are general, even on small tonnages of reinforcing bars. In the aggregate, several thousand tons of bars are under negotiation, but because of the weakness of prices buyers are in no hurry to cover. The market for merchant bars, on the other hand, is firm at 2c., base Pittsburgh, with the demand very fair for August. Mills are still competing actively for structural steel business, and fabricators report that it is still possible to do 1.90c., base Pittsburgh, for round tonnages of standard shapes. The market for plates is rather quiet, but firm, at 1.90c. per lb., base Pittsburgh.

Cast Iron Pipe.—No municipal lettings were reported the past week. Two towns have awarded jobs to contractors, involving round tonnages of pipe, but contractors have not confirmed oral orders for the pipe. Private business in standard pipe, as well as in Class A and gas pipe, holds up well, and total sales for the week ran well up into four figures. The market for small pipe remains firm, while for large diameters it is unsettled. Prices quoted openly on domestic pipe follow: 4-in., $60.10 a ton, delivered common Boston freight rate points; 6 to 12-in., $55.10 to $56.10; larger pipe, $54.10 to $55.10. The usual $5 differential is asked for Class A and gas pipe.

Coke.—Foundries in general show no inclination to stock coke far ahead and, owing to the comparatively low rate of their operations, are specifying against last half contracts sparingly. Both the New England Coal & Coke Co. and the Providence Gas Co. are holding to $12 a ton, delivered within a $3.10 freight rate zone, for by-product foundry coke. Both intimate prices will not be lower this year and possibly will be higher. Should the Mystic Iron Works furnace blow in the first week in September, as now planned, it will have some effect on the New England Coal & Coke Co.'s coke supply, because the new ovens built to care for the needs of the blast furnace will not be ready for operation for some time. No pinch in the company's supply is anticipated, however.

Old Material.—Old material prices still tend upward. Buying between brokers is not quite so active as a week ago, and Pennsylvania steel mills are still resisting the advances in prices, but the movement of material out of New England the past week showed a slight increase. Heavy melting steel is selling at $11.75 to $12.25, on cars shipping point, with the bulk of business moving at $12 to $12.25. This is an advance of 25c. for the week and of about 50c. for the past fortnight. Prices on shafting are somewhat higher as the result of better demand, and there has been a sympathetic advance in street car axles. While the

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Soft steel bars and small shapes	3.265c.
Flat, hot rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway, rounds	6.60c.
Norway, squares and flats	7.10c.
Structural shapes—	
Angles and beams	3.265c.
Tees	3.365c.
Zees	3.465c.
Plates	3.365c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hexagons	3.95c.
Squares and flats	4.45c.
Toe calk steel	6.00c.

average range of going prices on specification pipe, turnings, borings and skeleton is no higher than last week, outside prices are being paid more often than heretofore, and sellers within the past day or two have raised asking quotations.

The following prices are for gross-ton lots delivered consuming points:

Textile cast	$19.50 to $20.00
No. 1 machinery cast	19.00 to 19.50
No. 2 machinery cast	17.00 to 18.00
Stove plate	13.00 to 13.50
Railroad malleable	19.00 to 19.50

The following prices are offered per gross-ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$11.75 to $12.25
No. 1 railroad wrought	12.50 to 13.00
No. 1 yard wrought	11.25 to 11.50
Wrought pipe (1 in. in diameter, over 2 ft. long)	10.50 to 11.00
Machine shop turnings	9.00 to 9.50
Cast iron borings, chemical	10.25 to 10.75
Cast iron borings, rolling mill	9.00 to 9.25
Blast furnace borings and turnings	8.75 to 9.00
Forged scrap	9.50 to 10.00
Bundled skeleton, long	9.50 to 10.00
Forged flashings	9.50 to 10.00
Bundled cotton ties, long	8.25 to 8.50
Bundled cotton ties, short	9.00 to 9.50
Shafting	16.00 to 17.00
Street car axles	16.00 to 17.00
Rails for rerolling	12.50 to 13.00
Scrap rails	11.50 to 12.00

Cincinnati

Pig Iron Inquiries Scarce—Furnace Coke Active—Scrap Still Rising

CINCINNATI, Aug. 17.—While pig iron sales in the past week were negligible, the market gradually is acquiring strength. It is estimated that approximately 60 per cent of the buyers in this territory have covered their requirements for the remainder of the year. There is, therefore, only a moderate tonnage for fourth quarter delivery yet to be contracted for. The furnace situation in the Ironton district is favorable to producers. The Marting Iron & Steel Co. has banked its Marting furnace for two weeks for repairs, and another company has such a comfortable order book that it has withdrawn temporarily from the market. These developments are important factors making for the success of the present effort to establish foundry iron on a basis of $20, base Ironton. In fact, a few orders have been booked at that figure, but the competition from the Valley and Lake furnaces prevents the complete elimination of sales of southern Ohio foundry grades at $19.50. The effect of the low prices quoted by northern Ohio producers is reflected chiefly in malleable iron, which remains as low as $19, base furnace, in this territory. There has been no material change in the Southern market. Alabama iron continues to sell at $20.50 to $21, base Birmingham, but the business taken north of the Ohio River has been light. Nominal quotations on Tennessee iron stand at $21, base Birmingham. Jackson County silvery iron is moving at a fair rate. A Pendleton, Ind., user has taken 150 tons, and a northern Indiana melter 100 tons. A local consumer bought 800 tons of Northern and Southern iron for the fourth quarter. Inquiries are scarce, and local dealers believe that there will be little buying of consequence until late September or October. The American Rolling Mill Co. will blow out one of its Columbus, Ohio, furnaces on Sept. 1 for relining and other extensive repairs. A sale of 600 tons of fluorspar is reported by a Cincinnati broker.

Based on freight rates of $3.69 from Birmingham and $1.89 from Ironton, we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25 (base)	$24.19 to $24.69
Alabama fdy., sil. 2.25 to 2.75	24.69 to 25.19
Tennessee fdy., sil. 1.75 to 2.25	24.69
Southern Ohio silvery, 8 per cent	30.39
So. Ohio fdy., sil. 1.75 to 2.25	21.39 to 21.89
So. Ohio malleable	20.89

Reinforcing Bars.—Bids now are being taken on 180 tons of bars for two buildings at the Kentucky State Normal School, Lexington, Ky. Action on 400 tons for the Hamilton Community Hotel, Hamilton, Ohio, has been postponed indefinitely pending the revision of present plans. New billet bars are quoted at 2c., base Pittsburgh, and rail steel bars at 1.90c., mill.

Warehouse Business.—Local jobbers are well satisfied with the volume of sales in the first half of August, which exceeded those in the same period last year and paralleled those in the early part of July. Tank plates have come forward as the leading product in total tonnage booked this month, while sheet sales also have shown a substantial increase. Only in structural steel and nails are the bookings disappointing. Prices remain unchanged.

Finished Material.—If specifications and orders are sustained at their present level during the remainder of the month, several local district selling offices will break all previous records for July and August bookings. In fact, as the month advances, the volume of business is increasing. There has been an upward turn in the sheet market, and producers, believing that prices will advance soon, are declining to book orders for fourth quarter delivery at the prevailing schedule. Reports from the South tell of a bumper cotton crop, while the agricultural sections of the Middle West have had a good season. Jobbers have only small stocks on hand, and are expected to become important buying factors in the near future. Structural steel has been exceedingly active during the past six weeks, with fabricators in this territory laying in a liberal amount of stock. Recent demand from consumers has given an impetus to the bar market, which is steady at 2c., base Pittsburgh. Bookings in the past two weeks have been the best for several months. Tank plates have been moving well at 1.90c., base Pittsburgh, and for at least one seller bookings in July were the largest this year but will be surpassed by those in August. Structural shapes are holding at 2c., base Pittsburgh. The fact that buyers no longer are insistent upon price concessions is an outstanding feature of the sheet market. Most mills are refusing to take orders for galvanized at under 4.30c., base Pittsburgh, although it is said that in some instances 4.20c. can still be done. Black and blue annealed are steady at 3.15c. and 2.30c., base Pittsburgh, respectively. The call for wire products continues to be light, but an improvement is expected in the next two weeks. Electrical wire has been in fairly good demand. Common wire nails remain at $2.65 per keg, Pittsburgh or Ironton, and plain wire at $2.50 per 100 lb., Pittsburgh or Ironton.

Coke.—Interest has centered on furnace coke. The heavy movement of coal to the tidewater region has had a beneficial effect on the price of beehive furnace grades in the Wise County district. The minimum quotation is now $3.75, ovens, and a number of sales have been made at $4. A northern Indiana consumer has contracted for 7500 tons of furnace coke for shipment during the next year. Inquiries for beehive furnace grades include two for 600 tons each and one for 1000 tons. By-product foundry coke is being shipped at a satisfactory rate by producers in the Portsmouth-Ironton and the Indianapolis districts. The possibility of a car shortage in the fall is being discussed locally.

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and structural shapes	3.40c.
Bars, mild steel or iron	3.20c. to 3.30c.
Reinforcing bars	3.20c. to 3.30c.
Hoops	4.00c. to 4.25c.
Bands	3.95c.
Cold-finished rounds and hexagons	3.85c.
Squares	4.35c.
Open-hearth spring steel	4.75c. to 5.00c.
No. 28 black sheets	4.10c. to 4.30c.
No. 10 blue annealed sheets	3.60c.
No. 28 galvanized sheets	5.25c. to 5.40c.
Structural rivets	3.75c.
Small rivets	65 per cent off list
No. 9 annealed wire, per 100 lb.	$3.00
Common wire nails, base per keg	2.95
Cement coated nails, base per 100-lb. keg	3.15
Chain, per 100 lb.	7.55
	Net per 100 Ft.
Lap welded steel boiler tubes, 2-in.	$18.00
4-in.	38.00
Seamless steel boiler tubes, 2-in.	19.00
4-in.	39.00

Carriers serving the West Virginia coal and coke producers are having difficulty in obtaining the prompt return of cars for loading purposes.

Based on freight rates of $2.14 from Ashland, Ky., $3.53 fram Connellsville, and $2.59 from Wise County ovens and New River ovens, we quote f.o.b. Cincinnati: Connellsville foundry, $7.53 to $8.53. Wise County foundry, $7.09 to $7.59; New River foundry, $9.59 to $10.09; by-product foundry, $9.64.

Old Material.—For the second consecutive week heavy melting steel and a number of other items have advanced 50c. a ton. Railroad offerings in the past week brought surprisingly high prices, and dealers are canvassing all other sources of supply in their endeavor to obtain desirable material. Recent increased operations have placed mills in a position where they now are about ready to replenish their waning stocks. Many of them, however, are unwilling to accept the quotations made by dealers and therefore will postpone their purchases for the present. Only in foundry grades is the outlook unfavorable. Otherwise dealers are anticipating a period of active buying during the next month.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel	$14.00 to $14.50
Scrap rails for melting	13.50 to 14.00
Short rails	19.00 to 19.50
Relaying rails	27.00 to 27.50
Rails for rolling	15.00 to 15.50
Old car wheels	13.00 to 13.50
No. 1 locomotive tires	18.00 to 18.50
Railroad malleable	15.50 to 16.00
Agricultural malleable	14.50 to 15.00
Loose sheet clippings	8.50 to 9.00
Champion bundled sheets	10.00 to 10.50
Per Net Ton	
Cast iron borings	7.50 to 8.00
Machine shop turnings	7.00 to 7.50
No. 1 machinery cast	18.00 to 19.00
No. 1 railroad cast	15.00 to 15.50
Iron axles	21.00 to 21.50
No. 1 railroad wrought	10.50 to 11.00
Pipes and flues	9.00 to 9.50
No. 1 busheling	10.50 to 11.00
Mixed busheling	7.00 to 7.50
Burnt cast	8.00 to 8.50
Stove plate	10.50 to 11.00
Brake shoes	11.00 to 11.50

Buffalo

Heavier Inquiry for Pig Iron—Bars Advanced for Fourth Quarter

BUFFALO, Aug. 17.—Improved demand for pig iron is featured by an inquiry from the East for 1500 tons of foundry iron and another from outside this district for 2000 tons. A third inquiry calls for 700 tons of foundry grades, and there are several ranging from 200 to 500 tons. Local furnaces are holding to $20, base, on business taken in this district, but a producer near Buffalo is reported to be quoting $18.50 to $19.50. The furnace at Troy is said to have advanced its price 50c. The Lackawanna plant of the Bethlehem Steel Co. now has seven blast furnaces in operation; the Rogers-Brown Iron Co., two; the Hanna Furnace Co., two; the Donner Steel Co., one; the Wickwire Spencer Steel Co., one, and the Tonawanda Iron Co., one.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

No. 2 plain fdy., sil. 1.75 to 2.25	$19.00 to $20.00
No. 2X foundry, sil. 2.25 to 2.75	19.50 to 20.50
No. 1X foundry, sil. 2.75 to 3.25	20.50 to 21.50
Malleable, sil. up to 2.25	20.00
Basic	19.00
Lake Superior charcoal	29.28

Finished Iron and Steel.—Prices on bars for delivery in the fourth quarter have been advanced to 2.365c., Buffalo, but most buyers are not yet ready to place their business for that period. Bars for delivery during the third quarter are being quoted at 2.265c. to 2.365c., Buffalo, depending on the tonnage involved. Shapes are firm at 2.265c. and plates at 2.165c., Buffalo. A local sheet mill is running 14 out of its 18 mills and would increase this rate but for lack of experienced help. Its price is 3.15c., Pittsburgh, on black sheets, and its deliveries have advanced to three weeks.

Old Material.—It is mainly a dealers' market, with the speculative element strong, but there has been some buying by mills of heavy melting steel at $17.50, with even higher prices reported paid. Dealers have been active in the rail market, having bought a considerable tonnage of steel rails at $17.75. Stove plate is in good demand at $15.50 and No. 1 cast at $16.25. There has been some buying of low phosphorus scrap at $19, and some sales have been made at $19.50. Demand for borings and turnings for blast furnace use has improved.

We quote prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$15.50 to $16.00
Selected No. 1 heavy melting steel	17.00 to 17.50
Low phosphorus	18.50 to 19.00
No. 1 railroad wrought	15.00 to 15.50
Car wheels	17.00 to 17.50
Machine shop turnings	10.00 to 10.50
Mixed borings and turnings	12.00 to 12.50
Cast iron borings	12.00 to 13.00
No. 1 busheling	16.00 to 16.50
Stove plate	15.25 to 15.50
Grate bars	14.00 to 14.50
Hand bundled sheets	12.00 to 12.50
Hydraulic compressed	15.00 to 15.50
No. 1 machinery cast	16.00 to 16.25
Railroad malleable	16.50 to 17.00
Iron axles	24.00 to 25.00
Steel axles	16.00 to 16.50
Drop forge flashings	13.75 to 14.25

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and structural shapes	3.40c.
Mild steel bars	3.30c.
Cold-finished shapes	4.45c.
Cold-finished Rounds	3.95c.
No. 28 black sheets	4.45c.
No. 10 blue annealed sheets	3.80c.
No. 28 galvanized sheets	5.60c.
Common wire nails, base per keg	$3.90
Black wire, base per 100 lb	3.90

Youngstown

Proposed Revision of Sheet Extras Stimulates Buying—Scrap Higher

YOUNGSTOWN, Aug. 17.—The Youngstown Sheet & Tube Co. is planning to announce a new schedule changing the base gage and the gage differentials on black sheets, effective Sept. 1. For more than a year the work of revision has been going on under direction of a leading executive of the company. The aim has been to establish a schedule of extras in which the cost of producing each gage is the determining factor in establishing the price. In anticipation of this announcement, larger sheet tonnages than usual for this season of the year are being placed with Valley mills, most of them for forward delivery.

Old Material.—High steel plant operations in July and August have contributed to an advance in scrap prices, destroying the usual differential between basic pig iron and scrap. In view of this situation, steel makers are using more pig iron and less scrap in their open-hearth furnaces. Basic pig iron is obtainable at $17.50, Valley furnace, while heavy melting scrap ranges from $17.50 to $18. Ordinarily there is a differential of $2 to $3 per ton between scrap and iron prices. Five weeks ago heavy melting steel was readily purchasable at $16.25 per ton. Heavy scrap purchases were recently made by the leading local consumer at an average price of $17 per ton, but efforts to secure additional tonnages at this figure have been as yet unavailing.

At a cost of $200,000 the Vulcan Rivet Co., Birmingham, which has been producing between 500 and 600 tons of rivets monthly, is building a steel addition which will increase its output to 2000 tons monthly, with bolts and nuts as added products. W. C. Martin is president. The company is capitalized at $150,000. Steel is obtained from the Tennessee Coal, Iron & Railroad Co.

St. Louis

Hot Weather Reduces Pig Iron Melt—Structural Job to Take 6000 Tons

ST. LOUIS, Aug. 17.—After an unusually active summer the pig iron market is experiencing a lull in buying. Sales for last week amounted to only about 200 tons, and no inquiries of size are pending. It is believed that buying for third quarter has practically ceased, and some melters have made purchases for fourth quarter delivery. The market is only fairly firm, for despite good bookings, makers still appear anxious for more business. Prices are nominally unchanged, with Chicago producers still being willing to take on business in this district at $1 a ton under the furnace price for Chicago delivery. Because of the extremely hot weather, foundries have been unable to operate more than two or three days a week.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices, $2.16 freight from Chicago, $4.42 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$22.66 to $23.16
Northern malleable, sil. 1.75 to 2.25	22.66 to 23.16
Basic	23.16 to 24.16
Southern fdy., sil. 1.75 to 2.25	24.42 to 25.42
Granite City iron, sil. 1.75 to 2.25	22.81 to 23.31

Old Material.—The market is a little easier. Consumers in the district are waiting for car orders from the railroads, and will not buy until these are placed. The extreme heat has also affected operations adversely. Improvement in business is expected after Sept. 1. New railroad lists include: Southern, 6200 tons; Chesapeake & Ohio, 8800 tons; Louisville & Nashville, 8000 tons; Rock Island, 6300 tons; Wabash, 2400 tons; Missouri-Kansas-Texas, 2000 tons; Missouri Pacific, 1200 tons; Gulf Coast Lines, 1070 tons; Mississippi River & Bonne Terre, 500 tons; Ann Arbor, 240 tons, and Pullman Co., 350 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

	Per Gross Ton	
Iron rails	$12.00 to	$12.50
Rails for rolling	16.75 to	17.25
Steel rails less than 3 ft.	16.75 to	17.25
Relaying rails, 60 lb. and under	20.50 to	23.50
Relaying rails, 70 lb. and over	26.50 to	29.00
Cast iron car wheels	15.25 to	15.75
Heavy melting steel	13.50 to	14.00
Heavy shoveling steel	13.50 to	14.00
Frogs, switches and guards cut apart	15.50 to	16.00
Railroad springs	17.50 to	18.00
Heavy axle and tire turnings	11.00 to	11.50
No. 1 locomotive tires	16.00 to	16.50
	Per Net Ton	
Steel angle bars	13.50 to	14.00
Steel car axles	19.25 to	19.75
Iron car axles	21.25 to	21.75
Wrought iron bars and transoms	20.25 to	20.75
No. 1 railroad wrought	12.25 to	12.75
No. 2 railroad wrought	12.00 to	12.50
Cast iron borings	9.75 to	10.25
No. 1 busheling	10.75 to	11.25
No. 1 railroad cast	14.75 to	15.25
No. 1 machinery cast	17.00 to	17.50
Railroad malleable	13.25 to	13.75
Machine shop turnings	7.00 to	7.50
Bundled sheets	7.00 to	7.50

Coke.—The demand for foundry coke has been very good, considering the season. Consumers in this district have been operating on short time as a result of the heat. There is very little activity in domestic coke.

Finished Iron and Steel.—After a lean summer, fabricators in this district are keenly interested in the structural steel for the St. Louis Civil Court House, 6000 tons, for which bids will be opened Aug. 24. The demand for reinforcing bars has been largely confined to smaller jobs, of which there has been a considerable number. Railroad business is very light. Orders from manufacturing users of steel continue on a conservative, steady basis, with the volume fairly satisfactory. Warehouse business is holding up well.

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and structural shapes	3.25c.
Bars, mild steel or iron	3.15c.
Cold-finished rounds, shafting and screw stock	3.75c.
No. 28 black sheets	4.60c.
No. 10 blue annealed sheets	3.60c.
No. 28 galvanized sheets	5.50c.
Black corrugated sheets	4.65c.
Galvanized corrugated sheets	5.75c.
Structural rivets	4.65c.
Boiler rivets	3.85c.
	Per Cent Off List
Tank rivets, ⅞-in. and smaller	70
Machine bolts	50 and 5
Carriage bolts	47½
Lag screws	55 and 5
Hot-pressed nuts, square, blank or tapped	3.25c. off per lb.
Hot-pressed nuts, hexagons, blank or tapped	3.75c. off per lb.

Steel Output at Youngstown Declines to 75 Per Cent

YOUNGSTOWN, Aug. 17.—In the Youngstown district railroad officers estimate that steel production is being curtailed to an average of 75 per cent, judging from tonnage of inbound and outbound materials. The Carnegie Steel Co. has reduced the operation of its Youngstown district plants to 82 per cent.

In the Mahoning Valley 40 of 53 independent open-hearth furnaces are melting, while 15 of 18 tube mills are under power. Skelp mills are operating on a parity with pipe mills, while the output of two plate mills is being diverted to tubular products.

Merchant bar and strip mills are running at 80 per cent of capacity. Tin plate makers are pressed to meet demands from packers and canners. Mill operations vary according to weather conditions, however.

Sheet mill production is being curtailed in this district because of sultry weather. Many mill workers are taking advantage of weather conditions to take vacations. This week 112 of the 127 sheet and jobbing mills are scheduled, but it is doubtful whether this rate of operations can be maintained throughout the week. Because of irregularities due to the weather, actual output has dropped to 70 per cent of capacity, in comparison with a schedule of 85 per cent.

Normal operations are being restored in the puddle mill department at the Girard, Ohio, works of the A. M. Byers Co., Pittsburgh, and schedules this week call for operation of 65 of the 88 puddling furnaces, in addition to the blast furnace and rolling mills. Several weeks ago production of puddled iron was sharply curtailed by a strike of boilers not affiliated with the amalgamated association, who endeavored to form an organization of their own.

A Shenango Valley furnace has orders on its books for 20,000 tons of iron, to be delivered in August; another is making heavy iron shipments to a consumer in Butler, Pa. Blast furnace interests are building up ore piles, and heavy shipments to inland furnaces from Lake docks are being made.

The Youngstown Sheet & Tube Co. is preparing to blow in one of its two blast furnaces in the Hubbard, Ohio, group, giving it seven active stacks of nine in the Youngstown district, including four at the Campbell works, two at Brier Hill and one at Hubbard. Of 40 blast furnaces in the Youngstown district, 27 are in action, and iron output is better sustained this summer than for any midsummer period since the war. This relatively high rate is chiefly attributable to the iron requirements of steel departments.

"Presentation of new models of automobiles by many leading companies during the past month has brought about an oversold condition in several lines," states *Automotive Industries* in its current issue. "Although a considerable portion of this is because manufacturers have not been able as yet to reach large production on their cars, it is due also in a large measure to the fact that the new cars have struck public fancy to an extent as great as in any former fall season, which indicates that a favorable market may be looked for." It is also stated that the unusually good export business done during the first six months of the year will probably continue through the remainder of the year. Sales of buses and trucks, both at home and abroad, are making larger gains than passenger cars.

REINFORCING STEEL

Conowingo Dam in Maryland Takes 6500 Tons —Week's Awards Nearly 16,000 Tons

Awards of concrete reinforcing bars as reported to THE IRON AGE during the week totaled nearly 16,000 tons, as compared with 16,500 tons in the previous week, which was the second largest total reported for the year. The Conowingo dam of the Susquehanna Power Co. at Havre de Grace, Md., took 6500 tons, while a factory building for the Oakland Motor Car Co. at Pontiac, Mich., and a warehouse in New York require 1000 tons each. Included in the 4500 tons pending is a warehouse in Jersey City, calling for 2500 tons. A number of jobs in Chicago on which the tonnage is being estimated are not included in this total. Awards follow:

BOSTON, 100 tons, warehouse, Goodyear Tire & Rubber Co., to Joseph T. Ryerson & Son, Inc., Boston.

MALDEN, MASS., 200 tons, power house, Malden Electric Co., to Edward A. Tucker Co.

NEW YORK, 1000 tons, warehouse, Lincoln Safe Deposit Co., to Concrete Steel Co.

EAST ORANGE, N. J., 150 tons, warehouse Lincoln Safe Deposit Co., to Igoe Brothers.

HAVRE DE GRACE, MD., 6500 tons, Conowingo dam of the Susquehanna Power Co.; 4700 tons to the Société Anonyme D'Ougrée-Marihaye of Belgium through its agents, A. Johnson & Co., 17 Battery Place, New York, and the remainder to American mills.

LOUISVILLE, KY., 300 tons, Brown Mercantile Building, to Laclede Steel Co.

ST. LOUIS, 200 tons, Barnes Hospital nurses' home, to Laclede Steel Co.

ST. LOUIS, 130 tons, factory building, Maloney Electrical Co., to Laclede Steel Co.

DONIPHAN, MO., 230 tons, Missouri State Highway bridge, to Laclede Steel Co.

PONTIAC, MICH., 1000 tons, factory building for Oakland Motor Car Co., to Pollak Steel Co.

CLEVELAND, 500 tons, factory building for Willard Storage Battery Co., to Bourne-Fuller Co.

CLEVELAND, 300 tons, warehouse for Cleveland Bonded Warehouse Co., to an unnamed company.

CHICAGO, 200 tons, rail steel, building at State and Lake Streets, to Inland Steel Co.

CHICAGO, 700 tons, building at Adams and Franklin Streets, to Olney J. Dean & Co.

CHICAGO, 200 tons, Lundheimer Building, to Olney J. Dean & Co.

SPRINGFIELD, ILL., 200 tons, rail steel, State road work, to Olney J. Dean & Co.

CHICAGO, 600 tons, Olsen Rug Co., to American System of Reinforcing.

CHICAGO, 625 tons, Park Lane Apartment Building, to Joseph T. Ryerson & Son, Inc.

CHICAGO, 125 tons, building, 117 West Madison Street, to Truscon Steel Co.

CHICAGO, 116 tons rail steel, store and hotel building, Lawrence and Kenwood Avenues, to Calumet Steel Co.

KOHLER, WIS., 350 tons, building, Kohler Co., to American System of Reinforcing.

SAN FRANCISCO, 600 tons, Mission Everett High School, to Gunn, Carle & Co.

SAN FRANCISCO, 175 tons, Sunnyside School, to W. S. Wetenhall Co.

SACRAMENTO, CAL., 390 tons, factory building, American Can Co., to unnamed company.

SACRAMENTO, CAL., 100 tons, Ventura County highway work, California Highway Commission, to unnamed company.

LOS ANGELES, 650 tons, Fletcher Highway bridge, to American System of Reinforcing.

LOS ANGELES, 250 tons, Hyperion-Glendale viaduct, to unnamed company.

Reinforcing Bars Pending

BOSTON, 100 tons, school, Beth Israel, general contract to Holt-Fairchild Co.

NEW YORK, 600 tons, building for American Book Bindery; general contract not let.

JERSEY CITY, 2500 tons, warehouse for Seaboard Refrigeration Corporation; general contract not let.

LEXINGTON, KY., 130 tons, two buildings for Kentucky State Normal School.

CHICAGO, 160 tons, Mark Twain Public School.

CHICAGO, tonnage being estimated, Lake Shore Towers Apartment; Roy France, architect.

CHICAGO, estimates being prepared, addition to Y. M. C. A. Hotel; M. Adams, contractor.

CHICAGO, tonnage not stated, addition to Carter Harrison Technical High School; F. N. Nielsen, general contractor.

CHICAGO, tonnage being estimated, building for Rayner-Dhlein Co.; Charles Christ, architect.

WAUKEGAN, ILL., tonnage not stated, theater and office building; James J. Redding Co., general contractor.

LA SALLE, ILL., tonnage being estimated, public high school; Childs & Smith, architects.

ROCKFORD, ILL., Orpheum theater; Hall & Page Co., general contractor.

BERKELEY, CAL., 1000 tons, pier for the Golden Gate Ferry Co., foot of University Avenue.

GOLD HILL, ORE., 124 tons, bridge across the Rogue River.

Mineral Resources of the United States

More than 120 pages of data are covered in a report of the Bureau of Mines giving 1925 mineral resources of the United States as a whole, and of the individual States. The statistical tables, filling 113 pages of the work, give quantities and values of a wide variety of materials in alphabetical order for 1925 and corresponding 1924 returns, together with, in many instances, figures for a series of ten years. The State tables, arranged alphabetically according to the name of the State, follow, with figures for 1924 and comparative figures for 1923. The booklet may be obtained from the Superintendent of Documents, Government Printing Office, Washington, for 20c.

Prepare Plans for Cement Plant at Cleveland

The Universal Portland Cement Co., subsidiary of the United States Steel Corporation, is working on plans for a new cement plant which it announced several months ago would be built in Cleveland. The announcement that plans for this plant were under way indicates that there is no basis for rumors that have appeared recently that the location of proposed plant would be changed from Cleveland to Detroit.

Sale of Bock Bearing Co. Approved

The sale of the plant and business of the Bock Bearing Co., Toledo, Ohio, to the Timken Roller Bearing Co., Canton, Ohio, was approved by the stockholders of the former company Aug. 16. The consideration is reported to have been in excess of $1,500,000. The transfer of the Bock plant will be made Aug. 24. R. E. Clingan, president of the Bock company will remain with the Timken organization.

Twist Drill Manufacturers Merge

A merger of the Whitman & Barnes Mfg. Co., Akron, Ohio, and the Detroit Twist Drill Co., Detroit, leading manufacturers of twist drills, has been effected. Consolidation plans previously worked out by the directors were approved by the stockholders of both companies, Aug. 16.

Gain in Payroll at Youngstown

Wages distributed during the first seven months of 1926 by industries at Youngstown, Ohio, totaled over $48,000,000, exceeding the payroll for the corresponding 1925 period by $2,400,000. The July payroll of $7,032,600 is $500,000 more than the wage disbursement for July, 1925, and marks the fourth consecutive month this year that the Youngstown wage bill has exceeded $7,000,000. If the present payroll rate is maintained, it will reach $83,000,000 for 1926, or $3,000,000 more than in 1925.

Will Dismantle Railroad

The Hyman-Michaels Co., Chicago, dealer in iron and steel scrap, has purchased the equipment of the Cleveland, Painesville & Eastern Railroad, a short haul road running from Cleveland to Ashtabula, Ohio, and will dismantle the property and sell the material, consisting largely of rolling stock and rails.

NON-FERROUS METAL MARKETS

The Week's Prices — Cents per Pound for Early Delivery

	Aug. 17	Aug. 16	Aug. 14	Aug. 13	Aug. 12	Aug. 11
Lake copper, New York	14.50	14.50	14.50	14.50	14.50	14.50
Electrolytic copper, N. Y.*	14.25	14.25	14.25	14.25	14.25	14.25
Straits tin, spot, New York	65.50	64.50	....	64.50	64.87½	64.75
Lead, New York	8.95	8.95	8.90	8.90	8.90	8.90
Lead, St. Louis	8.80	8.80	8.80	8.80	8.80	8.80
Zinc, New York	7.65	7.65	7.65	7.65	7.65	7.65
Zinc, St. Louis	7.30	7.30	7.30	7.30	7.30	7.30

*Refinery quotation; delivered price ¼c. higher.

NEW YORK, Aug. 17.—Although buying of non-ferrous metals, except tin, has been only fair during the past week, the undertone is one of strength, due largely to the comfortable position of producers as to orders on their books. Price changes have been relatively unimportant.

Copper.—A rise today of 10s. in the London price of copper lent strength to the domestic copper market, which had begun to sag slightly during the past few days. Although the larger producers have been holding firmly to quotations of 14.50c. per lb., delivered, for electrolytic copper, there had been sales by some interests at 14.37½c., delivered, and a few sales at 14.35c. Most of the metal available at these prices appears to have been cleaned up, however, by the beginning of this week, and the firmer situation abroad was quickly responded to here. Notwithstanding the few concessions in price during the week, the statistical position of the market has been strong in that the leading producers show no inclination to yield on price, and in fact there is very little pressure on them to do so, as all of the principal consumers covered their requirements for some time ahead in the recent heavy buying movement, and as a consequence the producers are still well supplied with orders. Export copper has been sold at 14.65c., c.i.f. foreign port.

Tin.—The tin market, which is extremely sensitive to speculative influences in other markets, was weakened by the slight reaction in stock market prices of the past week. Furthermore, the situation in London, where tin speculation has been active, has created a question in the minds of traders as to what may happen. There has been a good deal of buying in London for a further rise in price, but unless consumers come into the market soon there may be a tendency to unload. The probable outcome is in doubt, but traders derive encouragement from the fact that consumers are not well covered. More tin for September delivery will have to be bought, and very few users are covered for fourth quarter. Nevertheless, the London market was slightly weaker, and some holders of tin there showed a keen desire to sell. In the early part of last week there was very little business, but on Thursday there were sales here of 600 to 700 tons and other sales made the total turnover for the week about 1500 tons. Monday's sales were about 150 tons. Trading was mostly among dealers, but consumers are showing a little more interest. The price of spot Straits here today was 64.75c. per lb., a drop of 1.25c. per lb. in a week. London prices were £291 for spot standard, £285 15s. for future standard. £298 for spot Straits. The Singapore price was £291 10s.

Lead.—Although lead prices have been slightly easier in the past week at New York, they have held steadily at St. Louis. Consumers are well covered and producers have good order books, so there is no pressure either to buy or to sell. The St. Louis price continues at 8.75c. to 8.85c. per lb. for early delivery, with the quotation of the leading producer continuing at 8.90c., New York.

Zinc.—The zinc market has shown a little activity in the week, with galvanizers taking on a fair tonnage for August and September shipment. Prices are unchanged at 7.30c., St. Louis, and 7.65c., New York.

Metals from New York Warehouse

Delivered Prices per Lb.

Tin, Straits pig	66.50c. to 67.75c.
Tin, bar	68.75c. to 70.25c.
Copper, Lake	15.50c.
Copper, electrolytic	15.25c.
Copper, casting	14.75c.
Zinc, slab	8.50c. to 9.00c.
Lead, American pig	9.50c. to 10.00c.
Lead, bar	11.50c. to 12.50c.
Antimony, Asiatic	18.00c. to 19.00c.
Aluminum, No. 1 ingot for remelting (guaranteed over 99 per cent pure)	30.00c. to 30.50c.
Babbitt metal, commercial grade	30.00c. to 35.00c.
Solder, ½ and ½	40.50c. to 40.75c.

Metals from Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	68.75c.
Tin, bar	71.75c.
Copper, Lake	15.00c.
Copper, electrolytic	15.00c.
Copper, casting	14.00c.
Zinc, slab	8.50c.
Lead, American pig	9.75c.
Antimony, Asiatic	20.50c.
Lead, bar	11.25c.
Babbitt metal, medium grade	22.50c.
Babbitt metal, high grade	74.75c.
Solder, ½ and ½	42.25c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base per Lb.

Sheets—	
High brass	19.37½c. to 20.37½c.
Copper, hot rolled	23.00c. to 24.00c.
Copper, cold rolled, 14 oz. and heavier,	25.25c. to 26.25c.
Seamless Tubes—	
Brass	24.25c. to 25.25c.
Copper	25.00c. to 26.00c.
Brazed Brass Tubes	27.37½c. to 28.37½c.
Brass Rods	17.12½c. to 18.12½c.

From New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks	13.00c. to 13.25c.
Zinc sheets, open	13.50c. to 13.75c.

Non-Ferrous Rolled Products

Mill prices on bronze, brass and copper products are unchanged since the advance of Aug. 3. There has been no change in zinc sheets and lead full sheets since July 20 and 26 respectively.

List Prices Per Lb., F. O. B. Mill

On Copper and Brass Products, Freight up to 75c. Per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass	19.37½c.
Copper, hot rolled	23.00c.
Zinc	11.75c.
Lead (full sheets)	12.50c. to 12.75c.
Seamless Tubes—	
High brass	24.25c.
Copper	25.00c.
Rods—	
High brass	17.12½c.
Naval brass	19.87½c.
Wire—	
Copper	16.37½c.
High brass	19.87½c.
Copper in Rolls	21.37½c.
Brazed Brass Tubing	27.37½c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of the Mississippi River and also allowed to St. Louis on shipments to destinations west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	37.50c.
Tubes, base	48.00c.
Machine rods	34.00c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	19½c. to 20½c.
Copper, hot rolled	23c.
Copper, cold rolled, 14 oz. and heavier	25¼c.
Zinc	12.25c.
Lead, wide	11.25c.
Seamless Tubes—	
Brass	24¼c.
Copper	25c.
Brazed Brass Tubes	27½c.
Brass Rods	17⅛c.

Antimony.—Prices are a little easier, with 16.50c. per lb., New York, duty paid, being quoted for spot delivery and 16c. for September-October.

Nickel.—Wholesale lots of ingot nickel are quoted at 35c. and shot nickel at 36c. per lb. Electrolytic nickel is quoted at 39c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 27c. to 28c. per lb., delivered.

Non-Ferrous Metals at Chicago

AUG. 17.—This market is active, and the prices of copper, lead and zinc are steady. Tin lacks strength, and the quotation on antimony is nominal. Buying of old metals is in fair volume, but not so heavy as a week ago. Old metal prices are steady.

We quote, in carload lots, Lake copper, 14.75c.; tin, 65.50c.; lead, 9c.; zinc, 7.40c.; in less than carload lots, antimony, 17.50c. On old metals we quote copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9.75c.; red brass, 9.25c.; yellow brass, 8c.; lead pipe, 7.50c.; zinc, 5c.; pewter, No. 1, 35c.; tin foil, 43.50c.; block tin, 52c.; aluminum, 17.75c.; all being dealers' prices for less than carload lots.

French Iron and Steel Exports in First Half of 1926

PARIS, FRANCE, Aug. 6.—Exports of iron and steel products from France in June and in the half-year follow:

	First Half Year, Tons	June, 1926, Tons
Pig Iron:		
Total	234,057	38,521
To the United States	18,959	509
Rolled Iron and Steel (blooms, billets and bars):		
Total	1,041,934	155,027
To the United States	21,428	3,914
Castings:		
Total	131,145	26,081
To the United States	22,196	5,888
Rails:		
Total	132,508	17,460
To Italy	16,640	1,098
To Germany	15,095	2,123
To Switzerland	13,584	2,432
To Belgium and Luxemburg	11,514	1,568
To Great Britain	9,985	1,017
To Japan	9,745	2,857
To Brazil	7,035	339
To Morocco	5,983	54
To Algeria	3,131	317
To United States	2,389	13

A study of the red iron ores and iron-bearing sandstones of the Clinton formation in the Birmingham district, Alabama, has been made by the Bureau of Mines, Department of Commerce. The four ore beds in Red Mountain, which extends northeast and southwest between Birmingham and Bessemer, would become important sources of iron should a satisfactory method for beneficiating the high silica ores be devised, it is pointed out. Such a method would apply equally well to the associated ferruginous sandstones. Information regarding the ores is contained in Bureau of Mines Technical Paper 377, copies of which may be purchased from the Superintendent of Documents, Washington.

Civil service examinations are announced for fuel engineers for the Bureau of Mines at Washington and Pittsburgh. Applications must be made to the United States Civil Service Commission, Washington, not later than Sept. 7.

Old Metals, Per Pound, New York

The buying prices represent what large dealers are paying for miscellaneous lots from the smaller accumulators, and the selling prices are those charged consumers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, heavy crucible	12.25c.	13.50c.
Copper, heavy and wire	11.75c.	12.50c.
Copper, light and bottoms	10.00c.	11.25c.
Brass, heavy	7.25c.	9.00c.
Brass, light	6.25c.	8.00c.
Heavy machine composition	8.75c.	10.00c.
No. 1 yellow brass turnings	8.50c.	9.25c.
No. 1 red brass or composition turnings	8.25c.	9.25c.
Lead, heavy	7.75c.	8.00c.
Lead, tea	5.75c.	6.50c.
Zinc	4.25c.	4.75c.
Sheet aluminum	17.00c.	19.00c.
Cast aluminum	17.00c.	19.00c.

RAILROAD EQUIPMENT

Dearth of Inquiry and Orders for Cars and Locomotives—Business of Small Importance

The railroad equipment market continues dull, there being an absence of interest on the part of the railroads in new cars and locomotives except as regards a few small requirements. Details of the week's business follow:

The Consolidation Coal Co., New York, is in the market for 500 steel mine cars.

The Fruit Growers Express has placed an order with the Pressed Steel Car Co. for 533 steel underframes.

Bids went in on Monday on 2000 refrigerator cars for the American Refrigerator Transit Co. The inquiry was reported in the issue of July 29.

The New Orleans Public Belt Railroad has inquired for 50 40-ton box cars.

The Union Pacific is in the market for 7 baggage-sleeping cars.

The Seattle Municipal Street Railway Co., Seattle, Wash., has ordered 80 street cars from the St. Louis Car Co.

The East Jersey Railroad & Terminal Co. has ordered 4 40-ton steel underframe box cars, 2 40-ton steel underframe flat cars and 5 50-ton steel underframe gondolas from the American Car & Foundry Co.

The Soo Line is in the market for 10 Mountain type locomotives.

The St. Paul Bridge & Terminal Railway Co. ordered an 8-wheel switching locomotive from the Baldwin Locomotive Works.

Detroit Scrap Prices Advance

DETROIT, Aug. 17.—Some buying by Ohio mills and furnaces has given a much firmer tone to the market on old material in this district, with the result that advanced prices have been recorded on borings and short turnings, long turnings, hydraulic compressed sheets and flashings. Shipments of pig iron into the district are at the highest monthly rate for the year, and most automotive production schedules are set through October on this basis.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting and shoveling steel	$13.25 to $13.75
Borings and short turnings	9.50 to 10.00
Long turnings	9.25 to 9.75
No. 1 machinery cast	17.00 to 18.00
Automobile cast	20.50 to 21.50
Hydraulic compressed	12.00 to 12.50
Stove plate	13.50 to 14.50
No. 1 busheling	11.25 to 11.75
Sheet clippings	8.00 to 8.50
Flashings	10.75 to 11.25

Group insurance placed by the Equitable Life Assurance Society covering employees of the Carnegie Steel Co. in the Pittsburgh and Youngstown districts, including the New Castle and Farrell plants, now aggregates $150,000,000. Employees of the Sharon Steel Hoop Co. and its subsidiary, the Youngstown Pressed Steel Co., are also protected by group insurance. In all cases, the insurance is handled through employees' benefit associations.

FABRICATED STRUCTURAL STEEL

Awards of Week Exceed 34,000 Tons and Pending Projects Total 27,000 Tons—Some Sizable Jobs

Structural steel awards keep up at a very good mid-summer average, although there has been some falling off in plans for new construction, which may be reflected soon in the volume of structural steel work. The past week's awards were upward of 34,000 tons, including 8900 tons for the new plant of the Oakland Motor Car Co., Pontiac, Mich. Among pending projects amounting to more than 27,000 tons, the largest is a New York apartment building of 5000 tons, award of which probably will be made this week. Details as to awards follow:

BOSTON, 300 tons, Transit Commission, to Bethlehem Steel Co.

BOSTON, 375 tons, medical school dormitory, to New England Structural Co.

SPRINGFIELD, MASS., 3100 tons, transmission towers for New England Power Construction Co., for Vermont lines, to American Bridge Co.

CAMBRIDGE, MASS., 200 tons, Boston & Maine Railroad freight house, to Jones & Laughlin Steel Corporation.

WEST WARREN, MASS., 200 tons, two bridges for Boston & Albany Railroad, to McClintic-Marshall Co.

QUINCY, MASS., 162 tons, nurses' home, to Federal Iron Works.

NEW HAVEN, CONN., 200 tons, car shop for New York, New Haven & Hartford Railroad, to an unnamed fabricator.

NEW YORK, 1400 tons, 25-story apartment building at Lexington Avenue and Fiftieth Street, to Paterson Bridge Co.

NEW YORK, 600 tons, theater at Forty-fourth Street and Eighth Avenue, to Harris Structural Steel Co.

NEW YORK, 100 tons, steel scow for Raymond Concrete Pile Co., to Jones & Laughlin Steel Corporation.

NEW YORK, 250 tons, pavilion for Willard Parker Hospital, Sixth Street and East River, to Easton Structural Steel Co.

NEW YORK, 317 tons, two theaters, one at 252 West Forty-fifth Street and one at 242 West Forty-fifth Street, to George A. Just Co.

LITTLE NECK, L. I., 250 tons, public school No. 94, to Easton Structural Steel Co.

BROOKLYN, 1400 tons, apartment hotel on Ashland Place, to Hinkle Iron Co.

NEW BRIGHTON, S. I., 450 tons, public school No. 45, to Harris Structural Steel Co.

NEW YORK CENTRAL RAILROAD, 800 tons, bridges, to an unnamed fabricator.

ATLANTIC COAST LINE, 200 tons, bridge, to Virginia Bridge & Iron Co.

HARRISBURG, PA., 200 tons, Memorial bridge, to Fort Pitt Bridge Works.

HAVRE DE GRACE, MD., 2000 tons, crest gates for Conowingo dam of the Susquehanna Power Co., to Newport News Shipbuilding & Dry Dock Co.

WHEELING, W. VA., 575 tons, five river barges for Wheeling Steel Corporation, to American Bridge Co.

CLEVELAND, 450 tons, fifth and sixth units Upson Nut Co. plant, to Jones & Laughlin Steel Corporation.

CANTON, OHIO, 2000 tons, Timken Roller Bearing Co., factory extensions. General contract placed with the Middle States Construction Co., Cincinnati, and steel to the American Bridge Co.

PONTIAC, MICH., 8700 tons, factory buildings for Oakland Motor Car Co., 4700 tons, assembly building, to American Bridge Co.; 2200 tons, motors building, to Austin Co.; 2000 tons, car storage building, to Massillon Bridge & Structural Co.

LOUISVILLE, 1100 tons, Brown Building, to McClintic-Marshall Co.

MEMPHIS, TENN., 850 tons, Farnsworth Office Building, to Virginia Bridge & Iron Co.

CHICAGO, 2100 tons, LaSalle Street Bridge, to Strobel Steel Construction Co., steel to be fabricated by Mount Vernon Bridge Co.

CHICAGO, 150 tons, operator's house for bridge over Calumet River, to Ralph H. Simpson Co.

FREEPORT, ILL., 250 tons, building for W. T. Rawleigh & Co., to Continental Bridge Co.

SPRINGFIELD, ILL., 700 tons, Ridgley Farmers State Bank Building, to American Bridge Co.

MILWAUKEE, 200 tons, new University Club, to Milwaukee Structural Steel Co.

ST. LOUIS, 1000 tons, factory building, Moloney Electrical Co., to Mississippi Valley Structural Steel Co.

INDEPENDENCE, MO., 160 tons, auditorium for Church of Latter Day Saints, to Mississippi Valley Structural Steel Co.

BATESVILLE, ARK., 760 tons, State Highway Commission bridge, to St. Louis Structural Steel Co.

PORTLAND, ORE., 250 tons, three bridges for the Oregon Highway Commission, to Wallace Equipment Co.

ROLAND, WASH., 180 tons, Pilchuck River bridge and railroad crossing, to Hofius Steel & Equipment Co.

SAN MATEO, CAL., 375 tons, grade crossing under Southern Pacific and South San Francisco Belt Line tracks near San Mateo, for the California Highway Commission, to Dyer Brothers.

OAKLAND, CAL., 100 tons, warehouse for Drayage Service Corporation, Eighteenth and Peralta Streets, to Moore Dry Dock Co.

BEVERLY HILLS, CAL., 2000 tons, McCarty Hotel, to Llewellyn Iron Works.

Structural Projects Pending

SOMERVILLE, MASS., 300 tons, bridge, Boston & Maine Railroad.

WOODS HOLE, MASS., 100 tons, apartment and dormitory.

NEW YORK, 5000 tons, Medici apartment building, Central Park South; bids have gone in and award will probably be made this week.

NEW YORK, 2000 tons, reconstruction of High Bridge over the Harlem River; previous bids rejected.

NEW YORK, 300 tons, elevated railroad connection on the Culver Line at Coney Island.

WHITE PLAINS, N. Y., 400 tons, garage for Westchester Lighting Co.

PATERSON, N. J., 250 tons, sanitarium.

NEW YORK CENTRAL RAILROAD, 400 tons, highway bridges.

NORFOLK & WESTERN RAILROAD, 600 tons, bridges.

BALTIMORE, 300 tons, Baltimore City College addition.

HAVRE DE GRACE, MD., 900 tons, head gates for Conowingo dam of the Susquehanna Power Co.

ROANOKE, VA., 700 tons, theater and office building.

BALTIMORE & OHIO RAILROAD, 300 tons, bridge at Chicago.

ERIE RAILROAD, 350 tons, bridges at Jersey City and Paterson, N. J.

TAMPA, FLA., 1000 tons, buildings for a Catholic institution.

PITTSBURGH, 1500 tons, Roosevelt Hotel, Penn Avenue and Sixth Street.

CLEVELAND, 125 tons, New York Central Sixty-seventh Street Viaduct.

DETROIT, 1000 tons, addition to the Fort Shelby Hotel.

CHICAGO, 600 tons, grand stand for American League Baseball Club.

LOUISVILLE, 620 tons, bear-trap leaves for dams 46 and 50, Ohio River; United States Engineer's office will take bids until Sept. 13.

ST. LOUIS, 6000 tons, Civil Court House, steel awards to be made separately on bids to be opened Aug. 24.

ST. LOUIS, tonnage unknown, 3500 linear feet piling dikes and hurdles near Liberty, Mo., and 5500 linear feet near Wilkinson, Ill.; United States Engineer's office, 428 Custom House, will take bids until Sept. 1.

BREWSTER, WASH., 600 tons, State highway bridge.

PORTLAND, ORE., 2200 tons, building for Portland Gas & Coke Co.

OAKLAND, CAL., 190 tons, Baby Hospital, Eighty-seventh Avenue and East Fourteenth Street, Golden Gate Iron Works, low bidder.

SAN FRANCISCO, 1000 tons, transmission towers for Great Western Power Co.

SACRAMENTO, CAL., 250 tons, factory building for American Can Co.

BAKERSFIELD, CAL., 350 tons, Security Bank Building, Minneapolis Steel & Machinery Co. low bidder.

Pittsburgh Iron and Steel Market

(*Concluded from Page* 514)

for 15,000 tons of coke a month from Sept. 1 to Dec. 1, is reported to have closed on this tonnage at prices ranging from $3 to $3.25. Two other steel companies west of Pittsburgh are asking prices on 15,000 tons a month for last quarter shipment and have been quoted as high as $3.50. There is not much demand for spot coke for blast furnace use, but not much is available and lately there have been sales at all the way from $2.90 to $3.15 or from 5c. to 15c. a ton higher than a week ago. No change has been noted in spot foundry coke, which still is quotable at $4 to $4.50 for good brands. Despite reports of an early settlement of the British coal strike, the export demand for American coal continues, and it is estimated that shipments are running close to 1,000,000 tons a week with about half that tonnage going to England. This demand is helping mine operations, but not bringing about any higher prices. Prices are given on page 515.

PERSONAL

Charles F. Palmer, who was recently appointed manager of sales Pittsburgh Steel Products Co., has assumed his new duties at the company's general offices in Pittsburgh. Mr. Palmer has been active in sales and executive capacities in the railroad supply business for about 20 years. Prior to his connection with the Pittsburgh Steel Products Co., he was with the Frank E. Palmer Supply Co., St. Louis, in an official capacity and previously was secretary of J. W. Faessler Mfg. Co., Moberly, Mo. For the past 12 years he has been manager of the Chicago office of the Pittsburgh Steel Products Co., and two years ago was appointed manager of railroad sales of the same company in connection with his managership of the Chicago office. C. H. Van Allen has been appointed manager of the company's Chicago office to succeed Mr. Palmer. Mr. Van Allen during the period from 1893 to 1903 served in various capacities with the Wabash, Pennsylvania and Lake Shore & Michigan Southern railroads. In 1903 he became sales agent for John J. Dunn, wholesale and retail coal dealer, Chicago, and in 1911 went with the Griffin Wheel Co., Chicago. He has been connected with the Chicago office of the Pittsburgh Steel Products Co. since 1913.

C. F. PALMER

C. H. VAN ALLEN

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Harry S. Schott has been appointed general sales manager of the National Carbon Co., Philadelphia. He has been the company's assistant general sales manager for the last two years.

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Charles L. Baldwin has resigned his position as secretary and treasurer of the Pennsylvania Engineering Works, New Castle, Pa., and will enter another line of business on the Pacific Coast. J. K. Furst has been appointed treasurer of the Pennsylvania company and W. S. Wheeler secretary. S. B. Cleal has been made assistant secretary.

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D. B. Catton has been appointed manager of the Portland, Ore., office of the Chain Belt Co. to succeed the late A. C. Sullivan. Mr. Catton will have charge of the chain and conveyor business of the company in the Portland territory. He has been connected with the Chain Belt Co. since the opening of the Portland office three years ago, prior to which he was associated with the Midvale Steel & Ordnance Co. and the Meese & Gottfried Co. in San Francisco.

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F. O. Soper, formerly purchasing agent for the Velie Motors Corporation, Moline, Ill., has been appointed assistant sales manager. P. A. Mongerson, formerly assistant purchasing agent, has been made purchasing agent.

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Charles J. Davidson, at one time engineer in charge of power plants of the Electric Co., Milwaukee, and later a member of the firm of Woodmansee & Davidson, consulting engineers, Chicago, has recently been elected president and general manager of the Gilbert Grinder Machinery Co., Milwaukee.

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L. E. Nutt has been reelected president of the Moline Iron Works, Moline, Ill. Other officials reelected are B. V. Nutt, vice-president; M. C. Nutt, vice-president and secretary, and J. T. Miles, treasurer.

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Barnes Newberry, president Federal Products Corporation, Providence, maker of precision instruments, has been made assistant secretary of the Rhode Island Hospital Trust Co., Providence. He will assume his duties Sept. 1.

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Ernest S. Cox, for many years a manufacturers' agent in the Pittsburgh district, handling sales for eight companies, has become affiliated with the Boiler Tube Co. of America, Park Building, Pittsburgh, of which Marcus Boyd is president. This company sells all kinds of boiler tubes, specializing in bent tubes. Mr. Cox hereafter will devote his time to that company and the Chicago Nipple Mfg. Co., the Pittsburgh sales agency of which he has retained. He is secretary and treasurer of the Triangle Club, an organization of Pittsburgh iron, steel and metal manufacturers, jobbers and sales agents.

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Frederick J. McCoy, secretary National Forge & Tool Co., Irvine, Warren County, Pa., has sold his interest in that company to his partner, C. B. Wilder, and has become identified with the Clarendon Refining Co., Clarendon, Pa., in which he has bought a controlling interest.

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H. G. Davis, formerly associated with the Pfaudler Co., Milwaukee, has joined the sales organization of Foote Brothers Gear & Machine Co., Chicago. He will cover the north side and suburbs of Chicago.

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Percival H. Smith has been elected president of the Ferracute Machinery Co., Bridgeton, N. J., to succeed his father, the late Oberlin Smith. Henry A. Janvier has been elected vice-president to succeed Percival Smith, and Luther C. Meyers has been added to the board of directors.

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E. C. Sicardi, president of the Union Tank Car Co., New York, has retired. He had been in the service of the company for 36 years. His successor has not yet been elected.

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W. W. Spangler has been appointed supervisor of commercial research for the Westinghouse Electric & Mfg. Co., East Pittsburgh. He was formerly manager of the company's syndicate department.

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Williams MacGregor and S. F. Courter have been appointed general sales managers of the Carborundum Co., Niagara, Falls, N. Y. They will assist George R. Raynor, who will continue as vice-president in charge of sales, and will each be in charge of a sales division. Mr. MacGregor was formerly sales manager of the coated abrasive division of the Carborundum Co., having in charge the sales promotion of Carborundum paper and cloth, Carborundum brand garnet paper and cloth, Carborundum brand waterproof finishing papers and Alosite paper and cloth. Mr. Courter was formerly a district sales manager and was in charge of the office, warehouse and sales force in Philadelphia. He has been succeeded in that office by W. J. Griffith.

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G. J. Meyer, New England representative Truscon Steel Co., has been transferred to the company's Youngstown plant to take charge of new work to be undertaken. The Boston office is now under the management of L. A. Estes, who was in charge there from 1915 to 1921.

Ellis F. Muther, formerly with the Gisholt Machine Co., Madison, Wis., maker of lathes and machinery, has been appointed assistant to the president of the Gardiner Metal Co., 1356 West Lake Street, Chicago.

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L. J. Belnap, whose election to the presidency of the Worthington Pump & Machinery Corporation, New York, was announced in THE IRON AGE of July 22, was born at Burr Oak, Mich., Nov. 7, 1877. Later removing to Lincoln, Neb., he attended the public schools there, and afterward entered the University of Nebraska, from which he was graduated in 1898 with the degree of B. S. in E. E. During his college years he was employed in the summer vacations on survey and construction work for the Burlington Railroad in Montana and Wyoming, and soon after graduation entered the employ of the Western Electric Co., Chicago, as a student apprentice. Later he became associated in various technical, sales and managerial capacities with the Wagner Electric Co., St. Louis, the Bullock Electric Mfg. Co., Cincinnati, and the Allis-Chalmers Co. at Milwaukee and Montreal. In 1911 Mr. Belnap left the Allis-Chalmers Co. to become vice-president of the Rudel-Belnap Machinery Co., Ltd., Montreal, retaining his interest in that company until 1925. Simultaneously with his work in the Rudel-Belnap Co. he organized in 1914 the Ingersoll Machine Co. of Canada, Ltd., of which company he was president until 1920. From 1917 until 1919 he was managing director of the Williams Mfg. Co., Ltd., Montreal, and from 1919 until 1925 president of Rolls-Royce of America, Inc., Springfield, Mass. In 1925 and 1926 he was chairman of the board of the Wills St. Claire Co., Inc., Marysville, Mich. During the war he was assistant director of the British War Mission in Washington, and in addition to his duties there was actively engaged on war orders with the Williams Mfg. Co., Ltd., Montreal.

L. J. BELNAP

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H. H. Pleasance has been appointed sales manager of the Bourne-Fuller Co., Cleveland. He recently resigned as general sales manager of the United Alloy Steel Corporation, Canton, Ohio, to become affiliated with the Bourne-Fuller Co.

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C. J. Sullivan has joined the Pittsburgh district sales staff Youngstown Sheet & Tube Co., under G. W. Christopher, district sales agent. Mr. Sullivan has been in the general sales department Pittsburgh Crucible Steel Co., Pittsburgh, for the past four years and before that was with the Reading Iron Co., Reading, Pa., and the A. M. Byers Co., Pittsburgh.

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August A. Bolik, formerly press designer for the Cleveland Punch & Shear Works Co., is now sales engineer for the E. W. Bliss Co., Brooklyn, maker of pressed metal machinery, automatic can machinery and dies, with headquarters at the company's Cleveland office.

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The mid-summer outing of the New England Foundrymen's Association, held Wednesday, Aug. 11, at the Pomham Club, Providence, R. I., had the largest attendance since that of the annual meeting held in Boston last winter. It was proposed to hold outdoor sports, but owing to an all-day rain, members and guests entertained themselves at billiards, bowling and cards. A Rhode Island shore dinner, for which the club is famous, was served. During dinner there was a musical entertainment. C. E. Andrews, Whitehead Brothers Co., Providence, was chairman of the entertainment committee.

OBITUARY

PRESCOTT WARREN, formerly president of the Stanley Motor Carriage Co., Newton, Mass., died at the Peter Bent Brigham Hospital, Boston, on Aug. 11. Since the discontinuance of the automobile company he has devoted his activities to real estate. He was born at Cambridge, Mass., in 1874.

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JOHN E. THROPP, president of the John E. Thropp Sons Co., Trenton, N. J., manufacturer of mechanical stokers and rubber making machinery, died Aug. 12 at his home in Penn Manor, Pa. He was 61 years old, and with the late Albert Delaski, was a designer of important tire making machinery. He was also president of the Delaski & Thropp Co., Trenton, also maker of tire machinery.

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W. G. BRANGHAM, for 20 years superintendent of the tin mill of Falcon Steel Co., Niles, Ohio, and later superintendent of the tinning department of Trumbull Steel Co., Warren, Ohio, died July 24 at the home of his daughter in Warren. He had resided in New York for the last two years, where he was connected with the American Can Co.

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JOHN FAHNLINE, of Sharon, Pa., a pioneer in the industrial development of the Shenango Valley, died Aug. 13 in a hospital at Ipswich, Mass., while returning from a motor trip in Maine. With John Stevenson, Jr., Mr. Fahnline was active in organizing a number of industries in Sharon, including the Driggs-Seabury Ordnance Corporation, subsequently sold to the Savage Arms Corporation. He was 68 years of age.

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WILLIAM B. REED, vice-president H. B. Smith Co., Westfield, Mass., manufacturer of heating boilers and radiators, died Thursday, Aug. 5, at Edgartown, Martha's Vineyard, in his fifty-seventh year. He was a past president National Boiler & Radiator Association, chairman of the boiler output committee, National Boiler Association, a member of the American Society of Mechanical Engineers, general sales manager and a director of the H. B. Smith Co., and a member of numerous clubs and organizations.

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KURT HUESSENER, president American Heat Economy Bureau, Inc., Pittsburgh, died suddenly of heart failure at Stresa, near Milan, Italy, Aug. 7. Mr. Huessener, accompanied by his wife and son, was on a tour of Europe. He was born in Germany 47 years ago. For a number of years he was engaged in combustion engineering in England and came to the United States in 1915. He was the founder and organizer in 1922 of the company of which he was head at the time of his death.

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WILLIAM H. ELLIOT, head of the Elliot Frog & Switch Works, East St. Louis, Ill., died in Green Bay, Wis., on Aug. 8. The plant with which he was connected during his entire business life, and of which he was president until 1925, was founded by his father, Henry Elliot. Mr. Elliot's holdings in the East St. Louis and Pueblo, Colo., plants were sold in 1925 to the Ramapo Ajax Corporation, New York, of which concern he became a director, remaining in charge of the East St. Louis works. He was born at Nashville, Tenn., in 1865, and educated at St. Louis and Kemper Military Academy, Booneville, Mo.

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HARRY W. SUMMERS, one of the best known steel men in the Philadelphia district, who for many years had been assistant general manager of sales in that district for the Carnegie Steel Co., the Illinois Steel Co. and the Tennessee Coal, Iron & Railroad Co., died suddenly of heart disease on Aug. 14. He was 53 years of age, and started work with the Steel Corporation as a salesman 25 years ago. The funeral was held Tuesday afternoon, Aug. 17.

Machinery Markets and News of the Works

AUGUST BRINGS A LULL

Machine Tool Business Better, However, Than a Year Ago

Reports to National Association Show That July Orders Ran Ahead of Those Received in June

AUGUST has brought a lull in machine tool buying, present indications being that the month may not equal July in volume of orders. According to reports received by the National Machine Tool Builders' Association from 55 of its members, July business ran ahead of June. July orders were 71.5 per cent above the average for the years 1922, 1923 and 1924. The July orders were larger than those received in either April or May of this year. Reports to THE IRON AGE indicate that August business, though it may show a decline from the July rate, will be a considerable improvement over that of August, 1925.

Railroad buying is slightly better than it has been in recent months. Among the roads which have bought a few tools are the Chicago & North Western, the Atchison, Topeka & Santa Fe, the Missouri Pacific and the Texas & Pacific. The Pittsburgh & Lake Erie is in the market for a quartering machine and a steam hammer. The Chicago, Rock Island & Pacific is expected to send out a list soon.

Among the more active buyers in the industrial field are the International Harvester Co., Chicago, and the A. O. Smith Corporation, Milwaukee.

The Chicago Board of Education has inquired for about 15 machines for a manual training high school.

New York

NEW YORK, Aug. 17.

REPORTS from New York machine tool selling agencies are that August business is not quite up to that of last month. This may be due in part at least to the vacation period, as it is known that in a good many instances the absence of executives on vacations is responsible for postponed action on contemplated purchases. The soundness of the industrial situation and general predictions as to active fall business in all lines lead the local machine tool trade to believe that machine tool buying will show an upward trend beginning the latter part of this month or early in September. An Eastern company has received an order from the Pullman Car & Mfg. Corporation, Pullman, Ill., for an axle lathe, car wheel borer and a straightening roll, and from the Missouri Pacific Railroad for a die sinking machine.

The Neptune Meter Co., 50 East Forty-second Street, New York, manufacturer of water meters, will build a three-story plant, 40 x 42 ft., on Davis Street, Long Island City, estimated to cost in excess of $100,000, with equipment. W. W. Knowles, Electric Building, Long Island City, is architect.

The New York Central Railroad Co., C. S. White, Room 344, 466 Lexington Avenue, New York, purchasing agent, is asking bids until Aug. 31, for a synchronous converter for power substation service. Also, at the same time, for transformer, switchboard apparatus, etc., serial contract No. 19-1926.

The Bronx Gas & Electric Co., 43 Westchester Square, New York, will soon ask bids for a four-story automobile service, repair and garage building, 65 x 210 ft., at St. Raymond and Purdy Streets, estimated to cost $350,000, with equipment. Thomas E. Murray, 55 Duane Street, is architect and engineer. E. S. Rosenquest is president.

The Consolidated Gas Co., 130 East Fifteenth Street, New York, has plans for additional plant buildings on Hunts Point Avenue, near Bay Avenue, consisting of two one and two-story mills for the coke division, 25 x 33 ft., and 17 x 50 ft., to be equipped as breaker and hammer departments, respectively; one two-story mixing plant, 35 x 96 ft.; one three-story screening station, 43 x 143 ft., storage bins, etc., estimated to cost $150,000 with equipment. J. F. Hunter, company address, is architect.

The Board of Education, Tarrytown, N. Y., contemplates the installation of manual training equipment in its proposed three-story high school addition at North Tarrytown, estimated to cost about $150,000. Knappe & Morins, 171 Madison Avenue, New York, are architects.

The Mack International Motor Truck Corporation, 25 Broadway, New York, will soon begin the construction of a new factory branch and distributing plant at St. Paul, Minn., estimated to cost close to $500,000, with equipment. It will be used as central headquarters for eight States in the Northwestern territory.

The American Water Works & Electric Co., 50 Broad Street, New York, has closed negotiations for the purchase of the plant and system of the Fort Madison Water Co., Fort Madison, Iowa, and will consolidate with its organization. Tentative plans are under advisement for extensions and betterments, including the installation of additional equipment. With this acquisition, the company is now operating a total of 31 waterworks properties in different States.

The Imperial Hardware Mfg. Co., 473 Hudson Avenue, Brooklyn, has leased the first floor of the plant of the Majestic Metal Spinning Co., 67 Navy Street, and will establish a new works at this location.

The International Nickel Co., 67 Wall Street, New York, has arranged an expansion program at its plant at Huntington, W. Va., to include additions to the metal refining works and rolling mills. Contracts for buildings have been let to the McClintic-Marshall Co., Oliver Building, Pittsburgh, and the H. K. Ferguson Co., Euclid Avenue, Cleveland. Awards for equipment are also being made and other orders for auxiliary apparatus will be placed later. The expansion will provide for considerable advance in output for monel metal and nickel sheets, as well as cold-rolled stock and nickel strip. W. L. Wotherspoon is consulting engineer.

The Blublaze Motor Specialties Corporation, 45 Seventh Avenue, Brooklyn, manufacturer of automobile equipment, has leased property at 35 Wilbur Avenue, Long Island City, for expansion, and will occupy at an early date.

Following the recent sale of a bond issue of $25,000,000, the Gatineau Power Co., operated by the International Paper Co., 100 East Forty-second Street, New York, has arranged for a second debenture issue of $12,500,000, the proceeds of both sales to be used for hydroelectric power development on the Gatineau River, Quebec. A. R. Graustein is president of both companies.

The Packard Motor Car Co. of New York, Broadway and Sixty-first Street, is said to have closed negotiations for the purchase of the entire block front property on Eleventh Avenue, between Fifty-fourth and Fifty-fifth Streets, as a site for a proposed seven-story service and repair building to cost in excess of $1,500,000, with equipment.

The Thatcher Co., 39 St. Francis Street, Newark, N. J., manufacturer of furnaces and heating equipment for domestic service, has acquired the former plant of the Hall Signal Co., vicinity of South Avenue and the Central Railroad of New Jersey, Garwood, N. J., owned for about a year past by the Union Switch & Signal Co., Swissvale, Pa. The main building, of one-story, 150 x 600 ft., the new

owner will use for the establishment of a branch plant in the future.

The General Lead Batteries Co., 4 Lister Avenue, Newark, N. J., has awarded a general contract to Louis Chevalier, Inc., 441 Lexington Avenue, New York, for the erection of its proposed one-story addition, 80 x 270 ft., estimated to cost $75,000, with equipment.

The Navy Department, Washington, is said to have preliminary plans under way for the rebuilding of a portion of the naval ammunition depot at Lake Denmark, Rockaway, N. J., recently destroyed by an explosion, and will ask bids on general contract in the near future. It is expected that from 20 to 30 buildings will be erected, with aggregate cost in excess of $300,000. Capt. R. R. Adams, U. S. N., is inspector of ordnance in charge at the depot.

The Public Service Railway Co., Public Service Terminal, Newark, N. J., has filed plans for a one-story motor bus service, repair and garage building at 833 Livingston Street, Elizabeth, N. J., to cost about $125,000, including equipment.

Fire, Aug. 11, destroyed a portion of the plant of the Hall Mfg. Co., 600-2 William Street, Harrison, N. J., operating a nickel plating and kindred engineering supply works, with loss reported at $100,000, including equipment. Plans for rebuilding are being considered. John Barto heads the company.

The Weston Electric Instrument Corporation, 614 Frelinghuysen Avenue, Newark, N. J., manufacturer of electrical measuring instruments, has taken out a permit for a new building at its plant to cost approximately $100,000.

The National Motors Mfg. Co., Irvington, N. J., has been organized with a capital of $250,000, to take over and operate the local plant of the Day-Elder Motors Corporation, Coit Street and Paine Avenue, now in receivership. The new company will continue to operate the factory for the manufacture of Day-Elder motor trucks and parts. F. T. Macrae, Jr., is president of the new company; A. L. Rice and Walter R. Cook, vice-presidents.

The General Machine Co., 191 Caldwell Avenue, Paterson, N. J., has awarded a general contract to James P. d'Angelo, 33 Rockland Street, for a one-story addition to its machine shop.

The Roberts Tool & Supply Co., Syracuse, N. Y., has recently been appointed district representative for the line of speed reducers and gear products manufactured by the Foote Brothers Gear & Machine Co., Chicago.

The Justrite Mfg. & Machine Co., Inc., Westwood, N. J., has been organized with capital of $100,000 to manufacture oil burners and is also contemplating manufacturing a refrigerating machine for domestic and industrial use. All work except the manufacture of castings will be done in the company's own plant.

The Magnolia Metal Co. has removed from 113 Bank Street to 75 West Street, New York.

Philadelphia

PHILADELPHIA, Aug. 16.

THE Commercial Truck Co., 300 Hunting Park Avenue, Philadelphia, manufacturer of motor trucks, has taken title to property at American and Luzerne Streets, 212 x 924 ft., improved with a group of buildings consisting of two main one-story units, power house, storage buildings and minor structures, valued in excess of $550,000 and is said to be arranging for early expansion at this location.

W. R. Rogers, Jr., acting director, Department of Public Works, City Hall, Philadelphia, is asking bids until Sept. 1, for mechanical and electrical equipment for a sewage disposal project at the Northeast sewerage pumping station on Wheatsheaf Lane.

Harris, LeRoy & Clark, Inc., 901 North Broad Street, Philadelphia, automobiles, has acquired a new four-story building at 1337-39 Fairmount Avenue, extending to 1318-26 Olive Street, and will equip for a complete service and repair works. The structure will provide about 36,000 sq. ft. of floor space.

The Pennsylvania Railroad Co. has asked bids on general contract for a new one-story shop at its Altoona, Pa., repair works, to be used for tank car repair and service work; a crane runway will be installed. A. C. Shand, Broad Street Station, is chief engineer.

A permit has been issued to the Electric Storage Battery Co., Nineteenth and Allegheny Streets, Philadelphia, for the erection of its proposed two-story and basement factory, 170 x 190 ft., at Hunting Park Avenue and Donath Street, estimated to cost $175,000, with equipment.

The Logan-Oakland Motor Car Co., 4718 Broad Street, Philadelphia, local representative for the Oakland automobile, has plans under way for a three-story service, repair and sales building, 60 x 140 ft., at location noted, estimated to cost close to $130,000 with equipment. Thalheimer & Weiss, Wesley Building, are architects.

The Board of Education, Philadelphia, is considering the installation of manual training equipment in a proposed five-story junior high school at Sixteenth and Wharton Streets, estimated to cost $1,000,000, for which bids will be received on general contract Sept. 7. Irwin T. Catharine, Nineteenth and Ludlow Streets, is architect.

The Pacific Steel Boiler Co., Bristol, Pa., is completing the construction of its new plant at Bristol, Pa., where a tract of 15 acres of land was obtained a number of months ago, and will be in production at an early date. The plant will be developed to a capacity of more than 1,000,000 sq. ft. of boiler and plate construction per month. The corporation was formed late last year by officials of the General Boiler Co., Waukegan, Ill. O. T. Nelson is president.

The Lawrence Portland Cement Co., Northampton, Pa., has acquired property at Thomaston, Me., including limestone deposits, and plans the construction of a new mill at that place, estimated to cost in excess of $1,750,000 with machinery. The works will include a power house and machine shop. It is purposed to begin erection early in the coming year.

The Board of Education, Norristown, Pa., contemplates the installation of manual training equipment in its proposed two-story and basement junior high school at Logan, Pine and Roberts Streets, estimated to cost in excess of $200,000. Harry Akins is president of the board.

The Lehigh Valley Railroad Co., Weatherly, Pa., has completed plans for a one-story addition to its local repair shops to be used as a frog shop, reported to cost more than $45,000 with equipment. Executive offices are at 143 Liberty Street, New York.

Fire, Aug. 12, destroyed a portion of the pattern shop at the plant of the Lebanon Steel Foundry Co., Lebanon, Pa. The damage will be replaced at an early date and will not interfere with continuance of plant operations.

The Hall Planetary Thread Milling Machine Co., Fox Street and Abbottsford Avenue, Philadelphia, manufacturer of thread milling machines and milling machine accessories and attachments, has changed its name to the Hall Planetary Co.

The American Brown Boveri Electric Corporation, 165 Broadway, New York, has opened a district sales office at 922 Witherspoon Building, Philadelphia. Louis T. Peck is in charge.

New England

BOSTON, Aug. 17.

AUGUST sales of machine tools are smaller than those of most months this year, yet they are greater than they were a year ago. There is no real snap to business, however. The Mystic Iron Works, Everett, Mass., has bought a planer, two lathes, a shaper, a drilling machine, a bolt threader and a hammer, all used tools, the largest individual business reported for the week. Other used tools reported sold total 14. A new Cincinnati shaper has just been sold to a Lynn, Mass., shop; a 14 in. x 6 ft. lathe to a Boston house; a sensitive drill to a York State firm; and a large press to a greater Boston concern. A New England maker of boring machines has advanced prices approximately 10 per cent. Prices for machinery otherwise show no change. Small tool sales are holding up remarkably well for August. One of the largest dealers in small tools reports that sales for the first six months of 1926 were 70.1 per cent larger than those for the corresponding period last year.

Plans are in progress for a 100 x 120 x 200 ft. machine shop for the Atlantic Works, 80 Border Street, East Boston.

The New York, New Haven & Hartford Railroad has awarded contracts for the erection of round houses and machine shops at New Bedford, Scituate and Fall River, Mass.

The Maine Central Railroad has started the construction of a round house, machine shop and storage plant at Lewiston, Me. B. T. Wheeler, 222 John Street, Portland, Me., is the engineer.

The Narragansett Electric Light Co., Eddy Street, Providence, R. I., has awarded a contract for a transformer repair shop. Jenks & Ballou, 1035 Grosvenor Building, Providence, are the engineers.

The Connecticut Malleable Castings Co., New Haven, Conn., has been incorporated under the laws of that State.

The Crane Market

INQUIRIES for locomotive cranes continue to be rather active, and several sales have been made in the last week. It is indicated that a creditable volume of sales will be made before the close of the month. Electric overhead cranes do not seem to have the demand of earlier in the summer, and very few sales are reported. The three small capacity overhead cranes for the American Sugar Refining Co., Brooklyn, which were expected to have been awarded earlier in the month have not yet been placed, and it seems likely that few of the old inquiries will be awarded before the first of September. Among recent purchases are:

General Electric Co., Schenectady, N. Y., 100-ton electric overhead crane, reported placed with the Cleveland Crane and Engineering Co.

Thompson-Sitterly Co., Winter Park, N. C., 12-ton used Link-Belt caterpillar crane, from Philip T. King.

Symansky Brothers, Troy, N. Y., 25-ton, 50-ft. boom locomotive crane, from Browning Crane Co.

Texas Co., two 50-ton locomotive cranes, reported placed with the McMyler Interstate Co.

Frank Karge, 5541 Bishop Street, Chicago, stone yard, a 7½-ton, 50-ft. span, 3-motor, electric traveling crane from the Northern Engineering Works.

Charles R. Treat, Orange, Mass., is president; James A. Walsh, New Haven, vice-president; Frank C. Tuttle, New Haven, secretary, and William E. Eccles, West Haven, treasurer.

The Worcester Boys' Trade School, Concord Street, Worcester, Mass., has work nearing completion on a five-story addition on Prescott Street, 40 x 140 ft., and will have the structure ready for service for the fall term. The first floor will be equipped as an automobile mechanical department; the second floor will be used for a machine department; the third floor, for metal and wood pattern departments; the fourth floor, for woodworking and wood finishing divisions, and the fifth floor for the electrical department. The present building is three stories and it is expected that two additional floors will be added at an early date.

The Emery-Tatnall Co., Glenbrook, Conn., has been organized to manufacture testing machines and dynamometers. The company will manufacture testing machines in capacities ranging from 20,000 to 1,000,000 lb. and will also institute a service designed to reduce the cost of testing in industrial plants. One of its products will be an electric telemeter, a development of the United States Bureau of Standards for the remote electrical indicating and recording of strain in structures under static, live and vibratory loading. All products will be manufactured on contract.

The Eagle Oil & Supply Co., Boston, has been appointed distributer for the Quigley Furnace Specialties Co., Inc., New York, covering eastern Massachusetts and Rhode Island, for all Quigley products.

The Wallingford Steel Co., Wallingford, Conn., has plans for a one-story addition, 65 x 100 ft.

The Stand & Sweet Mfg. Co., Meadow Street, Winsted, Conn., manufacturer of magnet and other electrical wires, has plans under way for a new two-story addition, 50 x 85 ft., estimated to cost about $45,000, with equipment.

A power house will be constructed by the Board of Trustees, Beth Israel Hospital, Boston, at its proposed institutional buildings at Brookline and Longwood Avenues.

Morris Yoffe, Boston, care of William Pease O'Brien, 45 Milk Street, real estate, has acquired a plot of land on Walnut Street, totaling about 20,000 sq. ft., improved with a number of buildings, and will establish a structural steel works on the site. Improvements will be made in existing structures and machinery installed.

Following the recent closing of its locomotive repair shops at Concord, N. H., the Boston & Maine Railroad Co., Boston, proposes to concentrate operations at its Billerica, Mass., shops, transferring to this point all work heretofore handled at Concord, and will provide complete facilities for the increased service.

The Rhode Island Public Service Co., Providence, R. I., has been organized by officials of the Narragansett Electric Lighting Co., and the United Electric Railways Co., both of that city, to take over and expand the properties, consolidating under one management. Arrangements are being made to issue bonds in amount of $27,500,000, and 1,500,000 shares of stock, a portion of the proceeds to be used for extensions and improvements.

The New York, New Haven & Hartford Railroad Co. will proceed with the construction of its proposed new machine repair shop at the East Hartford, Conn., works by day labor. It will be one-story, 50 x 200 ft., estimated to cost $45,000, and will replace a structure destroyed by fire a number of months ago.

The Eastern Tractors Co., 94 Massachusetts Avenue, Cambridge, Mass., has acquired property on Main Street totaling about 15,000 sq. ft. and plans to use it for expansion.

The Boston Elevated Railway Co., 31 St. James Avenue, Boston, has plans for a new laboratory and mechanical testing building at 536 Harrison Avenue, estimated to cost $50,000, with equipment. Bids have been asked on general contract.

The New England Transportation Co., Providence, R. I., a subsidiary of the New York, New Haven & Hartford Railroad Co., operating its motor bus division, will begin the erection of a one-story motor bus service, repair and garage building, 150 x 300 ft., on Kinsley Avenue, reported to cost about $175,000, with equipment.

Detroit

DETROIT, Aug. 16.

PLANS are being arranged by the Vinco Tool Co., 1326 Brush Street, Detroit, for a new one-story addition to cost about $40,000, including equipment. T. C. Hughes is in charge.

The Electric Storage Battery Co., Nineteenth and Allegheny Streets, Philadelphia, and 5740 Cass Avenue, Detroit, has asked bids on general contract for a new one- and two-story factory branch and distributing works, 110 x 250 ft., at Chicago and Roselawn Avenues, Detroit, estimated to cost approximately $100,000. C. Howard Crane and B. A. Dore, 400 Huron Building, are associated architects.

Fire, Aug. 3, destroyed a portion of the woodworking plant at Factory No. 2, of the Fisher Body Corporation, Pontiac, Mich., with loss estimated at $100,000, including equipment. It is planned to rebuild.

The Common Council, Lincoln Park, Mich., plans the installation of pumping equipment in connection with a proposed municipal waterworks, estimated to cost $345,000. Bonds in this amount have been approved.

The Detroit Lubricator Co., Trumbull Avenue, Detroit, is taking bids on general contract for its proposed new addition, two-story, 55 x 110 ft., estimated to cost $50,000, and award will soon be made. Robert O. Derrick, Inc., 120 Madison Avenue, is architect and engineer.

The General Motors Corporation, General Motors Building, Detroit, will soon begin the construction of a steam power house, coal storage and service building at Milford, Mich., estimated to cost $115,000, with equipment.

The Grand Rapids Body Co., Grand Rapids, Mich., manufacturer of automobile bodies, has acquired the former plant of the Field Body Corporation, Owosso, Mich., defunct, at a receiver's sale for a stated consideration of $121,000, and plans the establishment of a new plant at this location.

Marx & Marx, 227 South Wood Street, Chicago, manufacturer of band instruments, have concluded arrangements for the purchase of a tract of 35 acres of land at New Troy, Mich., as a site for a proposed new factory. The initial unit will cost about $30,000.

V. J. Waier & Co., Hofman Building, Detroit, architects, have plans under way for a two-story automobile service, repair and garage building, 115 x 130 ft., on Tyler Avenue, near Twelfth Street, estimated to cost $100,000, with equipment.

The Wabash Railway Co., Railway Exchange Building, St. Louis, has awarded a general contract to the T. S. Leake Construction Co., 608 South Dearborn Street, Chicago, for the erection of its proposed one-story car repair shop, 40 x 220 ft., in the Oakwood district, Detroit, estimated to cost $100,000, including equipment. R. H. Howard, St. Louis office, is chief engineer.

The City Council, Saginaw, Mich., is considering the installation of pump-machinery in connection with extensions and improvements in the municipal water system. The entire project will cost about $400,000. Plans have been presented for approval. The Department of Water is in charge.

The James F. Miller & Hurst Corporation, General Motors Building, Detroit, designer and builder of foundries and in-

dustrial plants, has changed its name to the Miller-Hurst Corporation.

The New Era Mfg. Co., Kalamazoo, Mich., manufacturer of self-lubricating metallic packing, babbitt and non-ferrous metal products, has changed its name to the Durametallic Corporation.

The Nordmark Mfg. Co., 524 Butterworth Avenue, Grand Rapids, Mich., engaged in machine work and the manufacture of stampings, has changed its name to the Nordmark Engineering & Mfg. Co.

The Acme Stamping & Brass Works, manufacturer of non-ferrous castings, Zeeland, Mich., has changed its name to the West Michigan Brass Co.

The Richmond Forging Corporation, Richmond, Va., has opened an office at 14344 Robson Boulevard, Detroit, in charge of Joseph J. Roberts.

Buffalo

BUFFALO, Aug. 16.

THE Rochester Gas & Electric Corporation, Rochester, N. Y., has secured permission to issue preferred stock in amount of $3,680,000, the proceeds to be used in part for extensions and improvements.

The United States Alloys Co., Niagara Falls, N. Y., will ask bids on general contract in the near future for a two-story addition to its plant, 60 x 94 ft., reported to cost about $35,000.

The Watson Paper Co., 200 East Sixteenth Street, Erie, Pa., has plans for extensions and improvements in its machine department, two-story, 50 x 190 ft., estimated to cost about $32,000. Hugh Nelson, Scott Building, is engineer. R. W. Potter is president.

The Curtiss Aeroplane & Motor Corporation, 74 Kail Street, Buffalo, is developing maximum capacity at its plant, covering parts, assembling and motor divisions, with employment of about 600 operatives as compared with approximately 150 a year ago this time. The company has contracts with the United States Army and Navy, and the current rate of output will continue for the remainder of the year. C. Roy Keys is vice-president and general manager.

The Board of Education, Scottsville, N. Y., is considering the installation of manual training equipment in its proposed two-story high school, estimated to cost $200,000, for which it is expected to ask bids on general contract early in September. Carl Ade, 104 East Avenue, Rochester, N. Y., is architect.

G. Elias & Brother, Inc., 965 Elk Street, Buffalo, manufacturer of airplanes and parts, is considering the construction of a new plant at the Buffalo aviation field as soon as it is completed. The proposed works will be given over both to parts production and assembling. The present plant has a capacity of two complete airplanes per week, and this output will be considerably increased at the new site.

Indiana

INDIANAPOLIS, Aug. 16.

BIDS will soon be asked by the Remy Electric Co., Anderson, Ind., manufacturer of electric lighting and starting systems, a division of the General Motors Corporation, for a proposed new unit at its plant, to be one-story and basement reported to cost close to $100,000. It will be known as plant No. 5. C. E. Wilson is general manager.

The Fairfield Mfg. Co., Lafayette, Ind., purposes to defer until early next spring the erection of its proposed one-story and basement machine shop addition, 70 x 200 ft., estimated to cost $50,000, with equipment. A site has been selected on Wallace Avenue, fronting on the Belt Railroad. A. A. Gustafson is general manager.

Plans have been filed by Vonnegut, Bohn & Mueller, Indiana Trust Building, Indianapolis, architects, for a two-story automobile service, repair and garage building, 95 x 300 ft., at 24-30 West Twenty-seventh Street, reported to cost about $90,000, with equipment.

The Schwab Safe & Lock Co., Lafayette, Ind., has awarded a general contract to Frank Vester, South Ninth Street, for a one-story addition, 42 x 125 ft., estimated to cost about $25,000.

The Board of Education, Seventh and Vine Streets, Evansville, Ind., has tentative plans under way for a new vocational school for boys in conjunction with a gymnasium building at the central high school, estimated to cost $150,000. It is expected to proceed with the work early in the coming year.

The Dwiggins Fence Co., Anderson, Ind., manufacturer of iron fencing, etc., has plans for a one-story addition, 35 x 115 ft., estimated to cost about $25,000. E. R. Watkins, Farmers' Trust Building, is architect.

The Indianapolis Belting & Supply Co., 34 South Capital Street, Indianapolis, has recently been appointed as district representative for the speed reducers and gear products manufactured by the Foote Brothers Gear & Machine Co., Chicago.

The Indianapolis Street Railway Co., Indianapolis, is planning the construction of six electric power sub-stations, to cost $351,000. Robert I. Todd is president.

The Kearney & Trecker Corporation, Milwaukee, has moved its Indianapolis office to larger quarters at 616-617 Continental Bank Building. Robert W. Ott, branch manager, continues in charge.

Chicago

CHICAGO, Aug. 16.

SALES of machine tools in the Chicago district show a rather sharp decline for the second week in August as compared with the volume placed during the previous week. This recession in demand is more noticeable in large tools than in smaller equipment. There remains a fair amount of inquiry before the trade, which expects that August may yet prove to be better than normal for this time of year. Prices as a rule are steady but there is a growing tendency among some classes of users to buy on price rather than on quality. The Chicago & North Western has placed a few tools, but other railroad lists appear to be inactive. The list expected from the Rock Island has not been issued. The International Harvester Co. bought several tools in the past week and the A. O. Smith Corporation, Milwaukee, is also an active buyer.

The Chicago Board of Education has issued the following list for the Hirsch, Jr., manual training high school.

One 20-in. band saw with a.c. motor, Syracuse or equal.

One 6-in. jointer on floor stand, with motor, Wallace or equal.

Four motor-in-head lathes, 12-in. swing, 55-in. bed with motor, American No. 1964-C or equal.

One 2-wheel, direct-drive grinder, 8-in. x 1-in. wheels, with motor, Hesey Wolf 3 W F D or equal.

One picture frame machine, Marsh or equal.

One squaring shear, 22-gage, 30-in., Pexto or equal.

One bar folder, 30-in., 22-gage, Pexto No. 63 or equal.

One Cornice break, 48½-in., 16-gage, Pexto No. 1005 or equal.

One forming machine, 31-in. x 2-in. rolls, Pexto 382 or equal.

Two turning machines, 22-gage, Pexto or equal.

One 20-lb. anvil.

Six machinists' vises, 4-in. jaw.

The Danly Machine Specialties, Inc., 4914 Lincoln Avenue, Chicago, has purchased from Sears, Roebuck & Co., one of their manufacturing plants, the Fulton Saw Works, 250 Second Avenue and Twenty-first Place, for $185,000. The new owner contemplates adding a foundry building to the plant.

The Western Pump Co., manufacturer of pumps, Davenport, Iowa, has changed its name to the Westo-Chippewa Pump Co.

The Tool Equipment Sales Co., 18 South Clinton Street, Chicago, has been appointed factory representative for the Titan Tool Co., Erie, Pa., manufacturer of the Titan quick-change drill chuck, tap adapters, stud setters and friction drive collets. A complete stock will be carried in Chicago.

The Falls Foundry Co., Cedar Falls, Iowa, will build an extension 40 x 96 ft., to cost $10,000.

The Chicago & North Western will build a $100,000 power house at Antigo, Wis. Plans are also under way for a $150,000 round house at that point.

The Chicago Hardware Foundry Co., North Chicago, Ill., announces that plans are under way for a $50,000 enlargement to its factory. The new building will house the plant for Verona furniture and metal furnishings.

The Crane Co., 832 South Michigan Avenue, Chicago, will build a one, two and three-story brick factory, 38 x 240 ft., to cost $400,000. William Adams Co., 209 South LaSalle Street, general contractor.

The Vanadium Alloys Steel Co., 1440 West Lake Street, Chicago, will build a one-story addition to shop, 19 x 100 ft., to cost $8,000. Mundie & Jensen, 39 South LaSalle Street, architects.

Quality Metal Bed Co., 1800 South Kilbourne Avenue, Chicago, suffered a loss, Aug. 11, by fire, estimated at $100,000.

Butler Street Foundry & Iron Co., 3424 Normal Avenue, Chicago, is virtually a total loss as the result of fire which swept through the plant Aug. 11.

The Rupp Mining Co., Garrison, N. D., plans the rebuilding of the portion of its tipple and machine shop, destroyed by fire July 31, with loss reported at $30,000, including equipment.

The Chicago, Minneapolis & Omaha Railroad Co., 278 East Fourth Street, St. Paul, Minn., has plans for a new one-story engine house with shop facilities at Sioux City, Iowa, estimated to cost $35,000.

The Chicago Screw Co., 1026 Homan Street, Chicago, has awarded a general contract to the John Hammond Co., 2234 Flournoy Street, for a two-story and basement plant, 120 x 125 ft., on Fillmore Street, near Homan Street, estimated to cost $100,000, with equipment. J. B. Fischer, 140 South Dearborn Street, is architect. H. E. Penfield is president.

The Owatonna Implement Mfg. Co., Owatonna, Minn., is planning for the rebuilding of the portion of its foundry recently destroyed by fire. Damaged equipment will be replaced.

The Sundstrand Corporation, 2400 Eleventh Street, Rockford, Ill., manufacturer of adding machines and parts, has awarded a general contract to Linden & Sons, 1110 Tenth Street, for a one-story machine shop, 116 x 130 ft., estimated to cost $27,000.

The Township Board of Education, La Salle, Ill., plans the installation of manual training equipment in its proposed three-story and basement high school on Charter Street, estimated to cost $550,000, for which bids have been asked on general contract. Childs & Smith, 720 North Michigan Avenue, Chicago, are architects.

Ohio

CINCINNATI, Aug. 16.

FEW sales of consequence were made by local machine tool builders the past week. There was, however, a moderate volume of orders for single machines. No one industry has been an outstanding contributor to the bookings of Cincinnati manufacturers, but there has been a fairly steady flow of business from varied sources through a period which normally is dull. That the outlook is encouraging is the testimony of every local machine tool company. The number of attractive inquiries now before the trade is indicative of active buying in the near future.

An automobile maker has bought a number of drills from a local builder. The International Harvester Co., Chicago, is reported to have closed for a fair amount of equipment and is expected to purchase additional tools in the next 10 days. Included in the orders placed in the past seven days are the following: Akron Rubber Mold & Machine Co., a 53-in. tire mold mill; Atchison, Topeka & Santa Fe Railroad, a No. 4 car wheel lathe, a 4-spindle multiple drill and a 90-in. quartering machine; Titusville Forge Co., Titusville, Pa., a 42-in. x 28-ft. engine lathe; Texas & Pacific Railroad, a 58-in. rod miller.

The General Box Co., Dayton, Ohio, is considering plans for enlargements in its local plant for large increase in output, particularly in the line of refrigerator boxes as furnished the Delco Co., manufacturer of Frigidaire equipment. The latter company is carrying out a large expansion program.

Homer W. Johnston, director of public service, Fremont, Ohio, is asking bids until Sept. 2 for a low service and high service pumping station, water purification plant and complete auxiliary equipment for the municipal waterworks. William G. Clark, Spitzer Building, Toledo, Ohio, is consulting engineer.

The Allen Automatic Tag Machine Co. of America, Inc., Chattanooga, Tenn., is said to be planning the construction of a local plant for the production of its patented machinery, reported to cost in excess of $50,000, with equipment.

The L. J. Breed Equipment Co., James Building, Chattanooga, Tenn., machinery dealer, has inquiries out for a 3-ft. radial drill, any standard make; also for a 24-in. shaper.

The director of public service, Columbus, Ohio, has awarded a general contract to E. H. Latham, 60 East Broad Street, for a two-story and basement mechanical and repair shop, 80 x 120 ft., and one-story service and garage building, 60 x 175 ft., for the municipal waterworks department, estimated to cost $90,000, with equipment.

G. Drach, 1701 Union Trust Building, Cincinnati, architect, has plans in preparation for a six-story and basement automobile service, repair and garage building, 92 x 190 ft., at Front and Rice Streets, Columbus, Ohio, estimated to cost $500,000, with equipment.

The Youngstown Welding Co., Youngstown, is preparing to move into a new plant along the Youngstown & Austintown branch of the Erie Railroad, at Wickliffe. The company manufactures truck tanks and is engaged in light plate construction.

The Toledo Pipe & Scrap Iron Co., 1102 Buckeye Street, Toledo, Ohio, has recently been incorporated and is specializing in the selling of new and used pipe, couplings and fittings. The company is in the market for all sizes of pipe.

St. Louis

ST. LOUIS, Aug. 16.

THE Missouri-Pacific Railroad Co., Railway Exchange Building, St. Louis, is reported to be planning the construction of new car and locomotive repair shops at Poplar Bluff, Mo., estimated to cost about $250,000, with equipment. E. A. Hadley is chief engineer.

The Roth Mfg. Co., Hastings, Neb., manufacturer of automobile equipment and accessories, is taking bids on general contract for the erection of its proposed one and two-story plant addition, 100 x 100 ft., estimated to cost $100,000, including equipment. K. H. Gedney, Second Street and Kansas Avenue, Hastings, is architect.

The Board of Education, Joplin, Mo., contemplates the installation of manual training equipment in its proposed new South junior high school, reported to cost $175,000, for which plans will be completed early in September.

The Crystal Refrigerator Co., Fremont, Neb., has awarded a general contract to the Truscon Steel Co., World-Herald Building, Omaha, Neb., for a one-story addition, 47 x 225 ft. F. Hammond is superintendent.

The Arkansas-Missouri Power Co., Blytheville, Ark., is arranging a note issue of $600,000, a portion of the proceeds to be used for extensions and improvements.

The American Iron & Machine Works, Oklahoma City, Okla., has recently moved its division headquarters to Oklahoma City from Tonkawa, Okla., and is planning to expand its plant at 815 North Indiana Street, Oklahoma City, Okla.

The Standard Semi-Steel Foundry Co., 202 East Chase Street, Springfield, Mo., will soon start construction on a new forge shop, 60 x 100 ft.

Milwaukee

MILWAUKEE, Aug. 16.

PROGRESS of machine-tool business so far in August is at a rate quite unusual for midsummer, and the capacity called into play for production to meet delivery specifications is measurably in excess of this period last year. Automotive plants not only are pressing for shipment of orders for machines placed two to four months ago, but in some cases are combing the market for production tools for quick delivery in order to take advantage of the active market for passenger cars that has developed with the introduction of new models. Railroad business is rather slow, but this source is furnishing some fair business for local tool builders. The outlook for fall business is promising.

The Aluminum Specialty Co., Manitowoc, Wis., is embarking on a general plant enlargement program, for which purpose it has increased its authorized capitalization from $600,000 to $1,000,000 by the additional issue of 4000 common shares of $100 par value. Details of the building and equipment project are expected soon. E. W. Krug is president.

R. J. Schwab & Sons, 283 Clinton Street, Milwaukee, manufacturers of furnaces and boilers, will build a two-story brick and concrete manufacturing addition, 40 x 75 ft. Henry E. Schwab is general manager.

The Fox River Machine Co., Kaukauna, Wis., is a new corporation, with $15,000 capital stock, organized to take over and develop an existing machinery manufacturing and repair business conducted by Dan McCarty, Emil Wurdinger, Jr., and Fred Miller. Enlargement of plant and production is planned.

The Racine Iron & Wire Works, Superior and Prospect Avenues, Racine, Wis., has increased its authorized capitalization from $40,000 to $80,000 and will employ the additional issue for enlarging the plant and its production of filter cloth, screens, fire extinguishers, etc. George L. Buck is president and treasurer.

The Fort Atkinson, Wis., Board of Education is asking bids until Aug. 30 for the construction of a new junior high and vocational school building to cost about $250,000. It will replace a structure recently burned. J. F. Schreiner is secretary of the board.

The largest shipment of machinery by an all-water route from Milwaukee to South America that has ever been made left Aug. 14, when a Canada Atlantic Transit Co. boat left the Milwaukee dock with 45 threshing machine outfits manufactured by the J. I. Case Threshing Machine Co., Racine, Wis., for Bahia Blanca, in the Argentine.

The Harnischfeger Corporation, Milwaukee, has appointed L. N. Ridenour, formerly with the Wellman-Seaver-Morgan Co., and later agent for contractors' equipment in Cleveland, as special factory representative. E. Lynn Puckett, Richmond, Va., has been made district manager of the corporation's Charlotte, N. C., office at 1118 Independence Trust Building.

Pittsburgh

PITTSBURGH, Aug. 16.

MACHINE tool business is running above the average of this time of year. There is a fairly good inquiry and single tool sales are frequent. The Pittsburgh & Lake Erie Railroad is in the market for a 90-in. driving wheel quartering machine and a double frame 6000-lb. steam forging hammer. The Carnegie Steel Co. has bought additional tables for its new H-beam mill at Homestead. Very prompt delivery is demanded on all parts for this mill, as the company wants to have it completed and ready for operation around Jan. 1 next.

Property at Airline Junction, Toledo, Ohio, totaling about 17 acres of land, has been acquired by the Southern Wheel Co., Commonwealth Building, Pittsburgh, manufacturer of car wheels, as a site for a new plant. The initial works will be equipped for a capacity of about 400 wheels per day. The company is a subsidiary of the American Brake Shoe & Foundry Co., 30 Church Street, New York.

The United States Engineer, Huntington, W. Va., will receive bids until Aug. 24 for a quantity of iron castings; also, for submarine cable and electrical supplies. Bids will be received at the same office until Aug. 25 for 1200 machine bolts and 1200 plate washers, circular 15.

The Duquesne Light Co., 435 Sixth Avenue, Pittsburgh, will make extensions in its Colfax generating plant at Cheswick, Pa., with the installation of additional equipment to increase the output from 250,000 to 310,000 hp. Contract for turbo-generating unit has been awarded to the Westinghouse Electric & Mfg. Co., East Pittsburgh.

The Midwest Steel & Supply Co., Inc., Bradford, Pa., will ask bids at once for a one-story addition to its mill at East Bradford, 50 x 100 ft., reported to cost in excess of $40,000 with equipment. J. Hillstrom is general manager.

The G. G. G. Metal Stamping Co., Warren, Pa., is said to be planning the installation of a stamping press and other equipment.

The Consolidation Coal Co., 67 Wall Street, New York, has plans under way for extensions and improvements in its properties in the vicinity of Clarksburg, W. Va., to include the installation of a new breaker, general mining machinery, electric power equipment, haulage equipment, etc., reported to cost in excess of $1,300,000. It is purposed to develop the property to a capacity of about 4,000,000 tons per annum.

The Guyan Machine Shops, Logan, W. Va., machinery dealers, have inquiries out for a circular milling saw to handle material up to 9 in. diameter; also for a punch and shear with capacity for handling plate up to ½-in. thick, and for a horizontal boring mill with table about 18 x 30 in.

The Titusville Forge Co., Titusville, Pa., has added to its machine shop equipment and now is in position to do large and small hollow boring and precision machine work.

The Struthers-Wells Co., Warren, Pa., has added materially to its facilities in the past year and now has a completely equipped plate welding plant.

Gulf States

BIRMINGHAM, Aug. 16.

THE Board of Aldermen, Bunkie, La., is asking bids until Sept. 7 for equipment for a proposed municipal sewage system, including two 500-gal. per min. capacity pumping units, sewerage lift station, and auxiliaries. Henry A. Mentz, Hammond, La., is consulting engineer.

The City Council, Wichita Falls, Tex., plans the installation of pumping equipment in connection with proposed extensions and betterments in the municipal water works, estimated to cost $350,000.

Giesecke & Harris, 207 West Seventh Street, Austin, Tex., architects, have work under way on a four-story automobile service, repair and garage building, 80 x 135 ft., with wing extension, 45 x 100 ft., on local site, estimated to cost $135,000 including equipment.

The Board of Commissioners of the Harbor and Terminal District, Lake Charles, La., is asking bids until Sept. 1 for a 750-gal. per min. capacity fire pump; 50-gal. per min. capacity electric-operated service pump; one 50,000-gal. steel tank on 100-ft. tower, and complete accessory equipment. Elmer E. Shutts, 291 Ryan Street, is engineer.

The Texas-Pacific & Missouri-Pacific Terminal Railroad, New Orleans, La., jointly owned by the Texas & Pacific and the Missouri Pacific, has begun the construction of new shops at Gouldsboro, near McDonoghville, La., including the rebuilding of the present plant and other improvements. The new work will include a new machine shop for locomotive repair work, with six pits to be served by a 100-ton traveling crane; heavy machine shop, with 10-ton traveling crane; light machine shop, boiler, forge and blacksmith shops. The work will also provide a new power plant for operating service and a complete boiler washing plant. The entire project will cost in excess of $1,500,000 including equipment. E. F. Mitchell, chief engineer, Texas & Pacific Railway Co., T. & B. Building, Dallas, Tex., is in charge.

In connection with a new steam-operated electric generating plant at Amarillo, Tex., work on which has been started, the Panhandle Power & Light Co., Commercial Bank Building, Houston, Tex., will make an initial installation for 10,000 kw. capacity, and at a later date purposes to advance this output to about 30,000 kw. The project will include new transmission lines and extension of present power system.

The Common Council, Farmerville, La., plans the installation of pumping equipment in connection with a proposed municipal waterworks, estimated to cost about $60,000.

The United Heater Corporation, 841 West Davis Street, Dallas, Tex., has been incorporated to manufacture and distribute water heaters. The company will not attempt at present to manufacture its own product but is having parts made on contract. C. W. Straus is secretary-treasurer.

The Ingram Equipment Co., Second National Bank Building, Houston, Tex., has been incorporated with capital stock of $20,000 and will deal in new and second-hand railroad and oil field machinery and will also act as manufacturers agents in the Texas district for new equipment used by railroads and oil companies.

South Atlantic States

BALTIMORE, Aug. 16.

CONTRACT has been let by George L. Sleight, Keyser Building, Baltimore, manufacturer of enamel products, etc., for his proposed one-story plant in the Brooklyn district, on site on Bell Grove Road, estimated to cost $20,000.

The Board of District Commissioners, District Building, Washington, is asking bids until Sept. 7 for cast iron fixtures and fittings for tops of street lamp posts.

The Baltimore & Ohio Railroad Co., Baltimore, is perfecting plans for the early enlargement of its yards and terminal facilities, including shops, at Toledo, Ohio, estimated to cost $1,500,000.

John Lample, 15 North Fremont Street, Baltimore, operating an automobile service, repair and garage business, has revised plans in preparation for a one-story top addition, 85 x 110 ft., estimated to cost $45,000. Additional equipment will be installed. John R. Forsythe, 16 East Lexington Street, is architect.

The Leadbetter Motor Co., 390 Southside Avenue, Asheville, N. C., has inquiries out for a drill press, with back gear and power feed.

The Norfolk & Western Railway Co., Clyde Cooke, purchasing agent, Room 351, N. & W. Railway Building,

Roanoke, Va., is asking bids until Aug. 25, for 101 cast steel side frames, contract serial AA-427.

The Atlanta Metallic Casket Co., 200 Elliott Street, Atlanta, Ga., has awarded a general contract to the Flagler Construction Co., Red Rock Building, for a two-story addition, reported to cost about $30,000 with equipment.

Lewter F. Hobbs, Inc., National Bank of Commerce Building, Norfolk, Va., machinery dealer, has inquiries out for two industrial gasoline locomotives, 36-in. gage, from 6 to 10 tons capacity each; also for a number of double side dump cars, each 4-yd. capacity.

The J. W. Goldsmith-Becker Co., 220 Peachtree Street, Atlanta, Ga., local representative for the Hudson and Essex automobiles, has leased a four-story building, 100 x 200 ft., at Spring and Harris Streets, to be erected by the Maxsell Realty Co., Atlanta. It will be equipped for service, repair and garage service, and is estimated to cost about $275,000.

The Common Council, Bladenboro, N. C., is considering the installation of pumping machinery in connection with the installation of a municipal waterworks. A fund of $35,000 is being arranged for the project.

The Board of Education, Danville, Va., plans the installation of manual training equipment in the proposed North Danville junior high school, work on first unit, estimated to cost about $90,000, to begin at an early date. Other units will be built later. Charles M. Robinson, Times-Dispatch Building, Richmond, Va., is architect.

The Wilson-Hock Co., City Point, Va., machinery dealer, has inquiries out for a number of industrial type electric motors, 75 and 125 hp. capacity, without pulley, but with base and full starting equipment; also for a squirrel cage type motor, 15 to 20 hp. rating, with starting equipment.

The Asheville School for Boys, Sulphur Springs, Asheville, N. C., Walter P. Fraser, director, has tentative plans under advisement for extensions, including installation of manual training equipment.

The Bethlehem Shipbuilding Corporation, Baltimore, a subsidiary of the Bethlehem Steel Co., Bethlehem, Pa., has acquired property adjoining its upper yard on the Key Highway, and plans for extensions, including the construction of three new piers, shops and other structures, reported to cost close to $1,000,000 with equipment. J. M. Willis is general manager.

The Moore Engineering Co., gray iron foundry and machine shop, Hagerstown, Md., has changed its name to the Dixie Machine Co.

The Crucible Steel Co. of America, New York, has opened an office at 337 Whitehall Street, Atlanta, Ga.

Pacific Coast

SAN FRANCISCO, Aug. 13.

CONTRACT has been let by the Standard Sanitary Mfg. Co., Bessemer Building, Pittsburgh, and San Francisco, manufacturer of enameled iron and other sanitary ware, to the P. J. Walker Co., Sharon Building, San Francisco, for a one-story plant, 350 x 1250 ft., at San Pablo, Cal., estimated to cost $500,000, including equipment. George W. Kelham, Sharon Building, is architect.

The Board of Education, Annandale, Cal., plans the construction of a vocational shop at its proposed group junior high school at the Luther Burbank school, for which bids will soon be asked on general contract. Noerenberg & Johnson, Los Angeles Railway Building, Los Angeles, are architects.

George M. McDowell, Railway Exchange Building, Portland, and associates have made application for permission to carry out a hydroelectric power project on the Deschutes River, Wasco County, to develop an output of 30,000 hp. A power dam, 70 ft. high and 530 ft. long will be built. The entire project is estimated to cost $3,000,000 with transmission system.

The Board of Education, Riverside, Cal., plans the installation of manual training equipment in three new junior high schools, estimated to cost about $800,000. Plans will be drawn for each unit individually, the architects selected being Alfred W. Rea and Charles E. Garstang, Pacific Southwest Bank Building, Los Angeles; Austin, Ashley & Austin, Chamber of Commerce Building, Los Angeles; and Marston, Van Pelt & Maybury, Union Oil Building, Los Angeles, respectively.

A. A. Brummel, Champion and State Streets, Bellingham, Wash., manufacturer of automobile tops and frames, etc., has awarded a general contract to Selene & Standen, Guide Meridian Road, for a new one-story plant at 602 Dupont Street.

The Los Angeles branch of the McMyler-Interstate Co., Cleveland, since Aug. 1 has been handled by the W. H. Worden Co., Inc., 126 Pine Street, San Francisco, and the McMyler branch manager has joined the Worden forces and is working out of the San Francisco office. The combined machinery and equipment business in Los Angeles is being conducted at the office and warehouse at 621 East Third Street. The Worden company is the agent in California, Arizona and Nevada for the Washington Iron Works, Seattle, maker of gas, electric, and steam hoists, Diesel engines, derricks, etc.; the McMyler-Interstate Co., power shovels, cranes, etc.; the Broderick & Bascom Rope Co., Seattle and St. Louis, wire rope and aerial tramways, and the Northwestern Motor Co., manufacturer of Casey Jones railroad section cars and equipment. F. W. Ward is the Los Angeles agent.

The San Francisco offices of the Cleveland Tractor Co. have been moved to 1345 Howard Street. I. L. Truax is manager of the San Francisco branch.

The San Francisco office of the National Meter Co., New York, has been moved to the company's recently completed warehouse and office building at 1048 Folsom Street. G. H. Bailey is San Francisco manager.

Foreign

THE Societa Generale Elettrica della Sicilia, Catania, Sicily, Italy, has contracted with operators of sulphur properties at Castrogiovanni, Sommatino and other districts for supply of electric power for the proposed electrification of the mines. Plans are under way for the construction of a steam-operated electric power plant at Catania, with transmission system about 300 miles long operating at 40,000 volts. A number of power substations will be built in the different sulphur districts. The entire project is estimated to cost about $1,400,000. The American Consulate, Rome, Italy, H. C. MacLean, commercial attaché, has information regarding the enterprise.

The American Chamber of Commerce in France, 32 Rue Taitbout, Paris, has received an inquiry (L-3345) from a company at Luxemburg desirous of getting in touch with American manufacturers of textile machinery suitable for the production of jute bags.

The American-European Utilities Corporation, an interest of Bertron, Griscom & Co., 40 Wall Street, New York, bankers, is said to be concluding arrangements with the Government of Poland for the electrification of Upper Silesia and the Warsaw and Cracow districts. The project will include a hydroelectric power development in the Carpathian Mountains. The company is also perfecting plans in cooperation with the Nieder Oesterreichische Eskompte, Vienna, Austria, for the construction of a hydroelectric generating plant at Korneuburg Schoenau on the Danube River, said to require from four to five years for completion.

Following a recent merger with the Cuban Utilities Co., the Havana Electric Railway, Light & Power Co., Havana, Cuba, is arranging for the sale of bonds in amount of $5,500,000, and preferred stock totaling $5,000,000, a portion of the proceeds to be for segregation of properties, extensions and improvements. Frank Steinhard is president.

NEW TRADE PUBLICATIONS

Electric Heating Equipment.—General Electric Co., Schenectady. Bulletins 280 and 498 of four pages each deal respectively with heating elements and heating equipment for industrial ovens. The element consists of what is known as the helicoil sheath wire unit, consisting of a nickel-chromium wire in the form of a helix surrounded by a dense, highly compacted insulating powder and connected to terminal rods securely anchored in the tube. The other bulletin shows a ribbon form of heater of nickel-chromium alloy and its application to japanning and enameling ovens and other types of industrial heating equipment.

Diesel Engine.—Foos Gas Engine Co., Springfield, Ohio. Bulletin 707 of four pages describes briefly a Diesel engine of 2 to 8 cylinders, ranging from 50 to 475 hp., and with speeds up to 900 r.p.m. The engine is completely inclosed.

Wire Rope Users' Handbook.—American Cable Co., 105 Hudson Street, New York. Catalog of 88 pages, dealing with different types of steel cable and cable fittings, including hooks, clips, thimbles, sockets, shackles, turnbuckles, etc. Instructions are given in detail as to methods of splicing, seizing and socketing wire rope. Illustrations and tabular matter occupy a large portion of the volume.

Electric Generators.—Climax Engineering Co., Clinton, Iowa. Bulletin F of 6 pages describes direct-connected generators driven by Climax gasoline engines. Both a.c. and d.c. units are featured, from 20 to 75 kw. The engines range from 57 to 142 hp.

Machines and Tools for Sheet-Metal Working.—Peck, Stow & Wilcox Co., Southington, Conn. Loose-leaf catalog, 8½ x 11 in. and nearly 1¼ in. thick, covering a wide variety of equipment for all sorts of work on sheet metal. Shears, punch presses, riveting and seaming machines, forming and drawing presses, beading, bending and flanging machines, steel drum equipment, as well as small tools in wide variety, are illustrated and described. The folder is indexed, while details are shown of a great many of the special machines covered.

Hand Cranes.—Herbert Morris, Inc., Buffalo. Book 104, describing for prospective buyers the various types of hand cranes offered by the company. The pamphlet aims to emphasize the importance to possible purchasers of securing a crane which is exactly suitable to their requirements. Traveling and beam cranes are included and also trolley hoists.

Grinding Wheels.—Abrasive Co., Bridesburg, Philadelphia. Catalog covering Borolon and Electrolon grinding wheels and polishing grain, and containing useful information for those interested in grinding.

Polishing and Burnishing Barrel.—Patterson Foundry & Machine Co., East Liverpool, Ohio. Four-page folder describing a belt-driven barrel for handling stampings, forgings and a wide variety of hardware items. Eight sizes are listed.

Switch Stand.—McMyler-Interstate Co., Bedford, Ohio. Four-page circular describing railroad switch with positive signal control, single cam operation and no exposed moving parts. Patents for this switch were issued last January to H. C. Odenkirk.

Oil Burner.—F. Beers & Co., Newark, N. J. Leaflet describing the P & B oil burner for atomization of oil by means of steam jet. Compactness, high capacity and low steam consumption are features claimed.

Gear Hobbing Machines.—Brown & Sharpe Mfg. Co., Providence, R. I. Leaflet describing the company's No. 34 gear hobbing machine (single purpose) designed for the production of spur gears of from 8 to 35 teeth. A special attachment provides for the hobbing of splined shafts and gears of from 3 to 17 teeth.

Electrical Fittings. — Crouse - Hinds Co., Syracuse, N. Y. Folder No. 38, describing the company's Arktite plugs and receptacles, interlocking switches and plugs and safety hand lamps. Bulletin No. 2087 deals with condulet branch extensions.

Milling Machines.—Rockford Milling Machine Co., Rockford, Ill. Booklet of 32 pages with many illustrations and diagrams, giving detailed account of the construction, operation and application of special attachments to the company's Rigidmil machine.

Roofing.—Truscon Steel Co., Youngstown, Ohio. Illustrated booklet, describing the company's two types of "steeldeck" roofing material showing methods of laying, insulation and waterproofing. The information is designed for the use of builders desiring a permanent, light-weight, non-combustible roof.

Reheating Furnaces.—Rust Engineering Co., 311 Ross Street, Pittsburgh. Leaflet describing the company's Rust-Amco 4-door recuperative reheating furnace with a 7 x 15 ft. hearth, with illustrations and diagrams.

Planers.—Niles-Bement-Pond Co., 111 Broadway, New York. Circular No. 325, describing the company's new "Time Saver" planer. Full details of construction and operation are given with numerous illustrations of its individual parts. The machine is made in sizes ranging from 36 to 72 in., requiring driving motors of from 20 to 35 hp.

Foundry Equipment.—Whiting Corporation, Harvey, Ill. Illustrated catalog No. 175, of 48 pages, describing the machinery made by the company and its subsidiaries. Some of the things listed are electric cranes of all sorts, cupolas, ladles, tumblers, core ovens, brass furnaces, steel converters, malleable furnaces, air hoists, foundry elevators, trolley systems, trucks and cars, turntables, sand cutting and screening machines, locomotive hoists, and various sorts of special machinery.

Railroad Shop Machinery.—Niles-Bement-Pond Co., 111 Broadway, New York. Circulars No. 326, 327 and 328, describing the company's turner lathes for locomotive journals, its 90-in. quartering machine and its 48-in. car wheel borer. Complete specifications are furnished for each machine.

Magnet Controllers.—Ohio Electric & Controller Co., 5900 Maurice Avenue, Cleveland. Leaflet describes the company's push-button magnet controller designed for the operation of a magnetic contactor used in connection with lifting magnets. Illustrations and diagrams of the instrument are given.

THE LAST WORD

(Contributed by the Reader Service Department of the Iron Age Publishing Co.)

IRON AGE NEW YORK
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This suggestion was prompted by the following letter from a big machinery builder:

> This company has made it a practice to bind THE IRON AGE since 1906. We have the volumes on file in our office and they are used by our friends, including many of the engineers. Occasionally they are exhibited in court in order to establish the prices of materials purchased many years back. We consider it a very valuable publication.

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HIGH tribute to the progressiveness and ability of American manufacturers was rendered by a noted German engineer in an address to a German engineering society. And the American publications serving those manufacturers came in for a kind word, too.

In fact, the speaker went so far as to recommend paying a higher salary to an engineer whose knowledge of English permitted him to read American trade papers and in that way to make it possible for his employer to profit by the information they contain.

We know of no instance where an American manufacturer pays a higher salary to anyone in his organization for reading THE IRON AGE. It isn't necessary, for it is common knowledge that the man who is wise enough to garner the ideas that the good trade paper picks up usually finds a pleasing upward trend in his salary.

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SELDOM do you find an American manufacturer who practises a penny-pinching policy with regard to furnishing the members of his organization with the trade papers they can use to advantage. To the best of our knowledge there is only one concern in the whole field served by THE IRON AGE that has a company ruling against subscribing to trade papers. And this particular company is not making out very well, which may or may not mean anything. A. H. D.